NATIONAL MUSEUM OF VICTORIA R. Pescott

Vol. XXIII. Part 2.

[Registered at the General Post Office, Melbourne, for transmission by Post as a Newspaper.]

The Journal of the Department of Agriculture of Victoria, Australia.

February, 1925.

PRINCIPAL CONTENTS

Crop and Fallow Competitions

Fertilizers and the Fertilizer Industry

Apricot Growing

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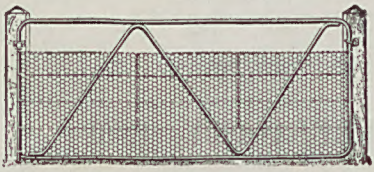

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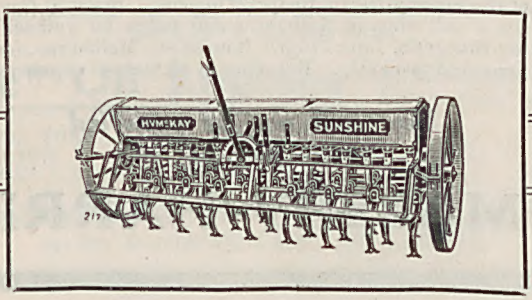

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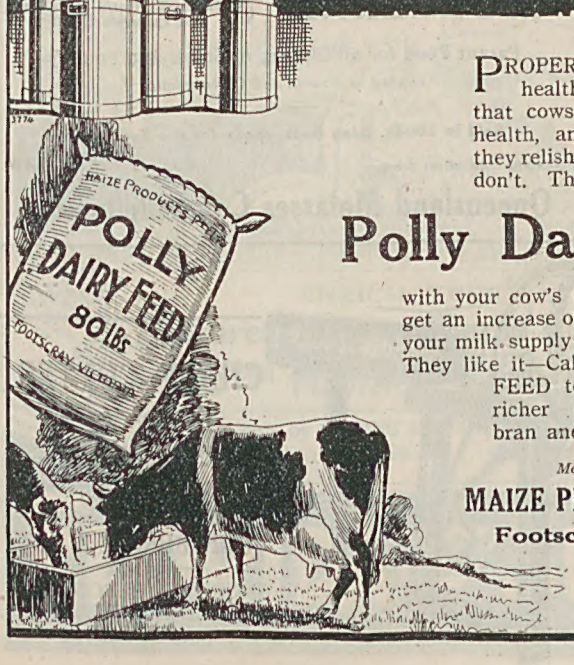

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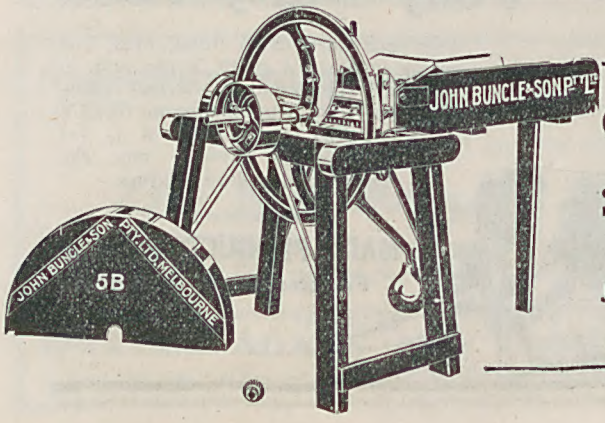

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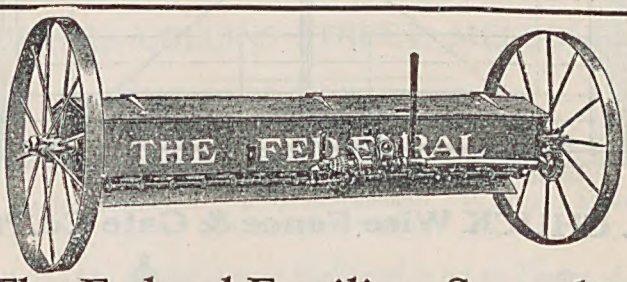

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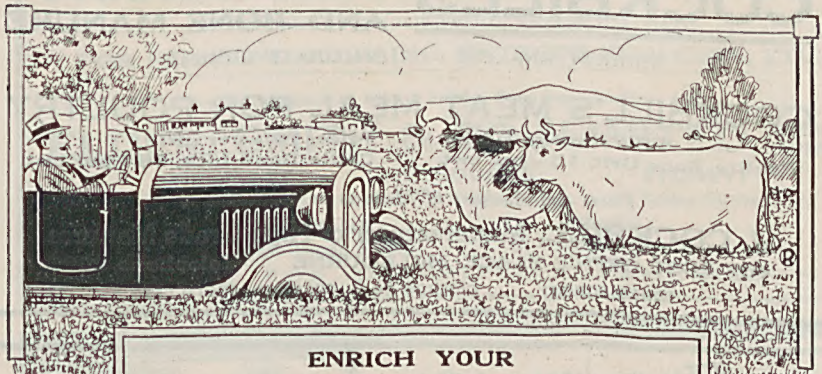

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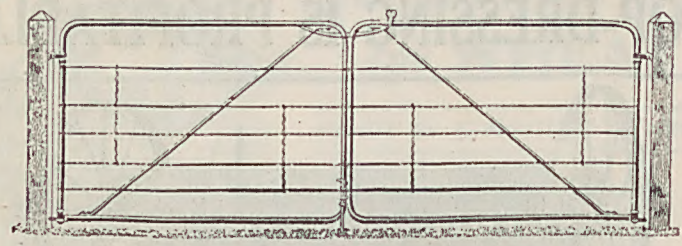

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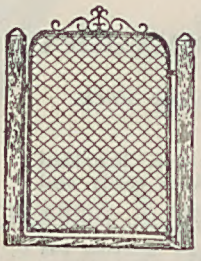

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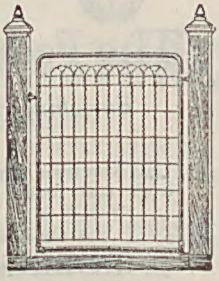

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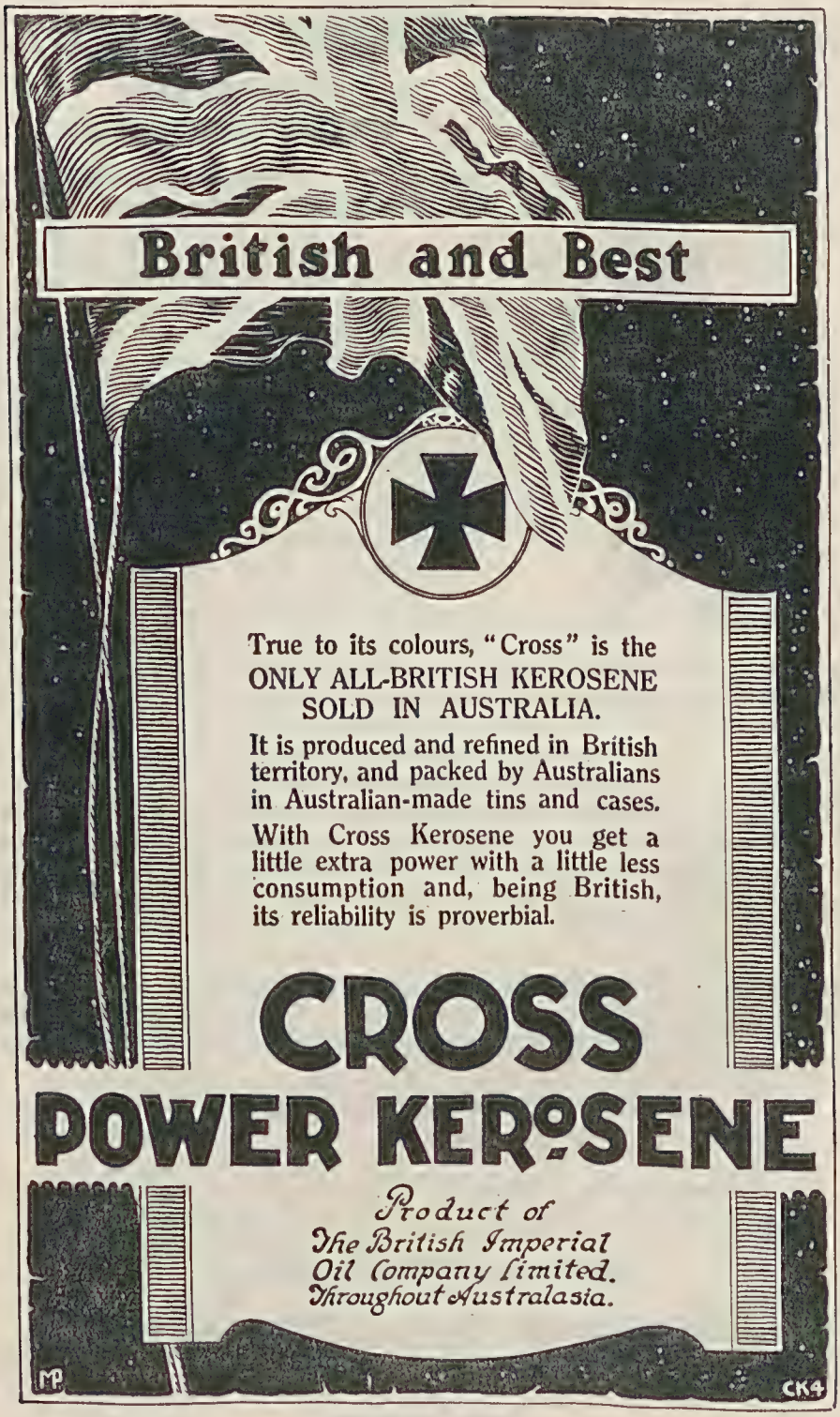
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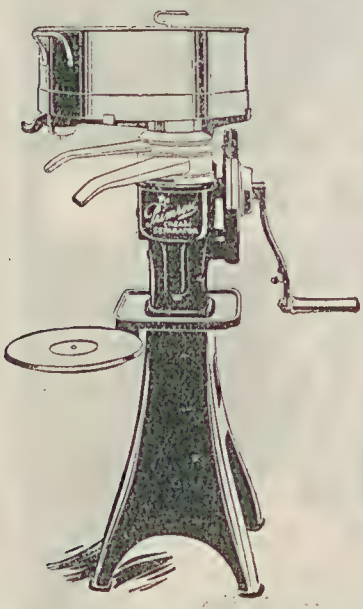

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Vol. XXIII. February, 1925. Part 2.

FERTILIZERS AND THE FERTILIZER INDUSTRY.

(Continued from page 22.)

By P. Rankin Scott, Chemist for Agriculture, and Will C. Robertson, Supervising Analyst.

SUPERPHOSPHATE.

History.

Superphosphate, or, as the name denotes, superior phosphate, stands alone on the pedestal of importance so far as commercialized plant nutrition is concerned. There is not any other artificial fertilizer the world over used to such an extent nor with such an effect. A substance produced in a form rendering it eminently suitable for its purpose, easy to manufacture at a comparatively low cost, its influence on plant growth is so marked that the most exacting mind cannot but fail to be convinced of its usefulness. It is one of the many chemical creations which help to convert the pessimistic farmer into an optimist.

In the year 1842, an Englishman named Lawes patented a process for the manufacture of superphosphate by treating mineral phosphates (i.e., natural earthy or rock deposits containing a large percentage of phosphoric acid in combination with lime) with sulphuric acid (oil of vitriol).

In 1840, two years prior to Lawes taking out his patent, a celebrated German chemist—Liebig—suggested treating bones (which consist mainly of phosphates of calcium) with sulphuric acid, the idea being to render the phosphoric acid more soluble and thereby accelerate the action of bone dust as a fertilizer.

Though with the advance in the science of chemistry this discovery could not have been long delayed, the farmers of to-day, and the community in general, have to thank, on the "fifty-fifty" basis, these two

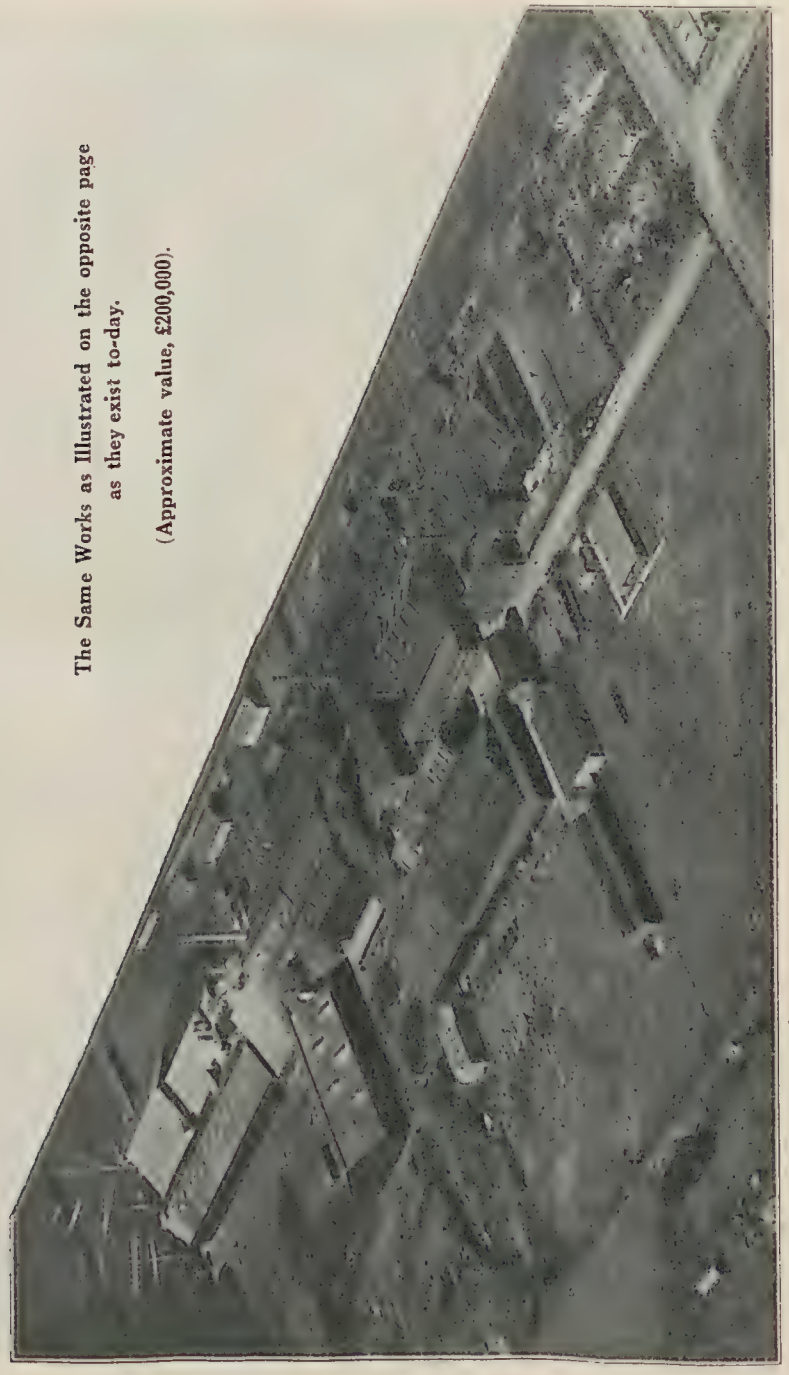
eminent chemists—Liebig and Lawes, the former for suggesting the process and the latter for establishing it on a commercial basis. The result of the discovery can hardly be over-estimated; suffice it is to say that, after a lapse of 84 years, in the State of Victoria, which was scarcely settled at the time, lands almost useless for cultivation without fertilizers are now made to produce profitable crops of golden grain through the application of superphosphate by means of the drill when sowing the seed.

If credit be given where credit is due, even after considering the great benefit derived from the introduction of Federation wheat, which was raised by the late William Farrer, the invention of the drill, with its many advantages, and the improved farming methods, of which the star feature is fallowing, there is no gainsaying the fact that the discovery of Lawes and Liebig (superphosphate) ranks first in importance in the benefit conferred on Australia.

The First Superphosphate Works Erected in Victoria (approximate value, £2,000).

At the time of his discovery, Lawes was established at the Rothamsted Station, in England, and being only twenty-six years of age—on the threshold of his career as a chemist—his intimate friends used their utmost endeavours to prevent him embarking on any commercial undertaking; nevertheless, following on his patent, Lawes established small works at Deptford, England, for the purpose of superphosphate manufacture, using at the commencement (as raw material), bone ash, and later, crag coprolites (nodules of Rock Phosphate) obtained from Suffolk. The superphosphate thus manufactured (1845) and which was sold at about £7 per ton, was in reality a crude superphosphate, being a mixture of soluble and insoluble phosphoric acid, and containing a small amount of nitrogen obtained from bones.

In Victoria, and, as far as is known, in Australia, the credit of establishing the superphosphate industry rests with the late Mr. James Cuming, sen. Statistics show that in 1872 a small tonnage of superphosphate, manufactured from bone-char treated with sulphuric acid, was exported to Mauritius, sugar being received in exchange. During the year 1883, the late Mr. James Cuming, sen., purchased these



The Same Works as Illustrated on the opposite page as they exist to-day.

(Approximate value, £200,000).

works, which were situated on the site of the present works bearing the name of the firm founded by him, and actively commenced the manufacture of superphosphate by mixing in a lead tank spent bone-char and bones with sulphuric acid. This was more than 40 years after the discovery of the process. The bulk of the initial output found its way to New Zealand.

In 1897, Mr. Cuming, in keeping with contemporary methods, imported Tennessee rock phosphate for use as a raw material in place of animal phosphate.

About this time, Mr. A. N. Pearson, who held the position of Chemist for Agriculture in Victoria, had a few farmers' experimental plots laid down, and commenced recommending superphosphate for use as a manure by farmers. Following successful results from the experimental plots the work of the Department of Agriculture began to tell and through a "vest pocket" publicity campaign, farmers began to be interested in this "new-fangled idea."

Following Mr. A. N. Pearson's resignation in 1901, Dr. Howell, who had previously occupied the position of travelling assistant (actually publicity officer) to Mr. Pearson, enlarged on the latter's work while at the same time organizing a "big push" in the use of the drill in preference to broad-cast sowing.

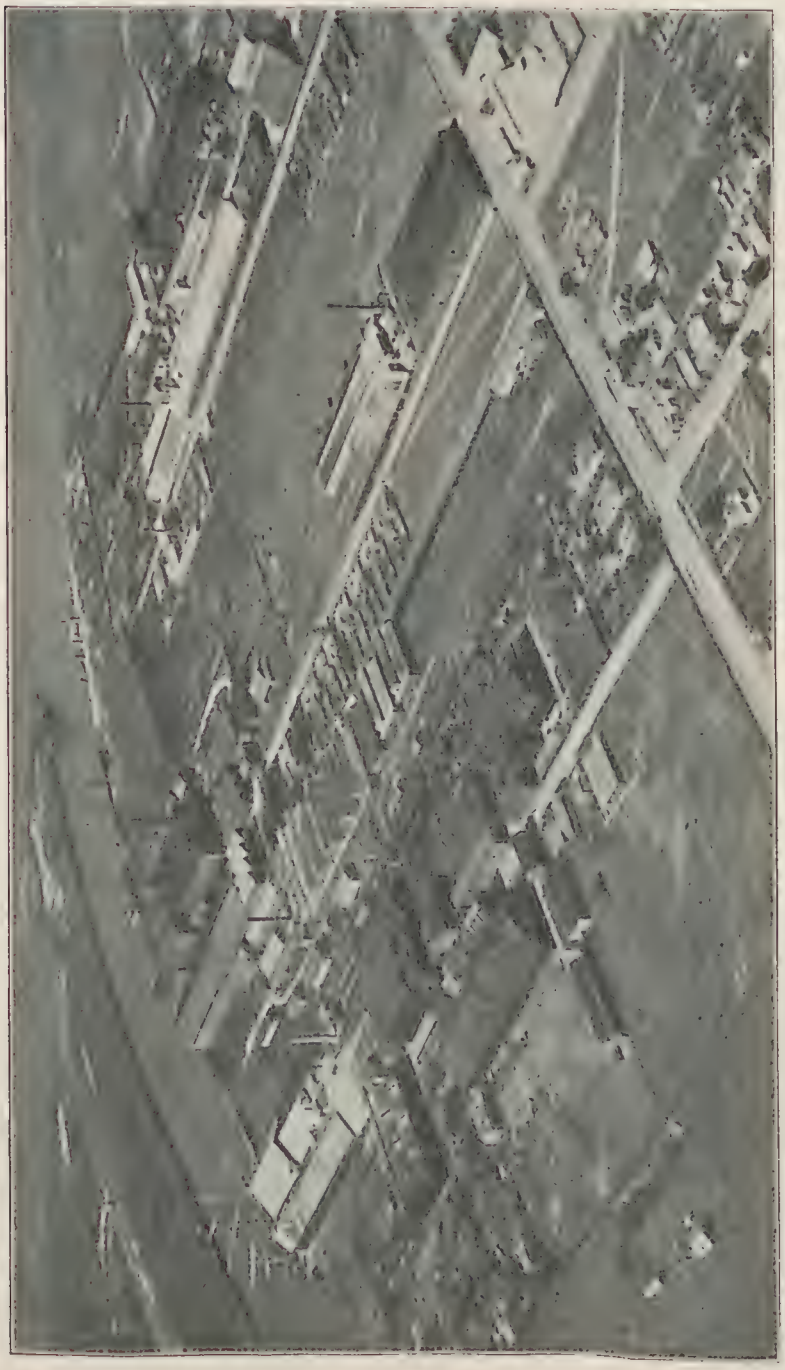
In recent years the creation of the Agricultural Division has enabled the Department of Agriculture not only to consolidate the position, but, ever-ready to experiment, observe and infer, to place the farmer in possession of new facts relating to the success attending the use of superphosphate for top-dressing pasture lands and the advantages accruing from increased dressings. With what result?

Firstly. The area on which superphosphate was used increased from approximately **600,000** acres in **1901** to **4,000,000** acres in **1924**—equivalent to **8.5 per cent. increase per annum.**

Secondly. The number of farmers using superphosphate increased during the same period from **11,439** to more than **40,000**—an increase of nearly **6 per cent. per annum.**

Thirdly. The production of superphosphate, roughly **20,000 tons**, worth **£100,000** in **1901**, increased to **200,000 tons**, worth **£900,000** in **1924**—an increase equivalent to **8,000 tons annually**, or over-all approximately **11 per cent. per annum.**

The magical wand of science waved over the agricultural industry in Victoria during the past quarter of a century has produced the following approximate progressive constant:—Every year 6 per cent. more farmers than in the preceding year cultivating 8.5 per cent. more acres, and using 11 per cent. more superphosphate—figures of which any Victorian may well feel proud, and facts which reflect the greatest credit upon (*a*) the pioneers of the superphosphate industry, (*b*) the hardy men who with dauntless courage went "out-back" with the will to succeed and won through, (*c*) the staff of the Department of Agriculture, whose duty it was to assist both classes and whose unbounded enthusiasm, strict sense of duty, and hard work have played no small part.



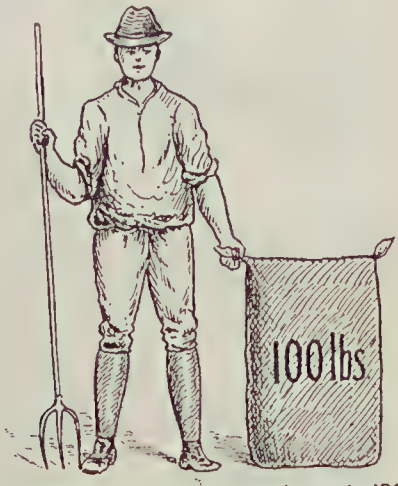
An Aeroplane View at Yarraville, showing how the Superphosphate Industry has Extended.

Sufficient data has been given to indicate the great advance made in the superphosphate industry in Victoria. A glance at the illustrations on pages 66 and 67, of the first factory to produce superphosphate in Victoria, (*a*) as it was when originally purchased 40 years ago for £2,000 or £3,000, and (*b*) an aerial view of the same factory as it exists to-day, the value of which would approximate £200,000, may prove of interest, and will help to give some idea of the capital necessary to supply the farmer with one great essential for increasing the yield of his crops.

At the present rate of progress, it is highly probable that twenty years hence facts and figures dealing with the superphosphate industry of our State will demonstrate a further stage in advancement, and place present figures well in the shadows.

In Victoria, there are five superphosphate factories, and the building of another is contemplated. Three of the factories are on or adjacent to the water front at Yarraville, within a few miles of the heart of the city; another is situated inland at Deer Park, but within the suburban radius, whilst one was erected last year on the Bay front, at North Geelong—some 40 miles from the Metropolis, and on the outskirts of the city of Geelong.

11439 Farmers used Fertilisers in 1901.
Average Dressing in 1901, 50lbs.



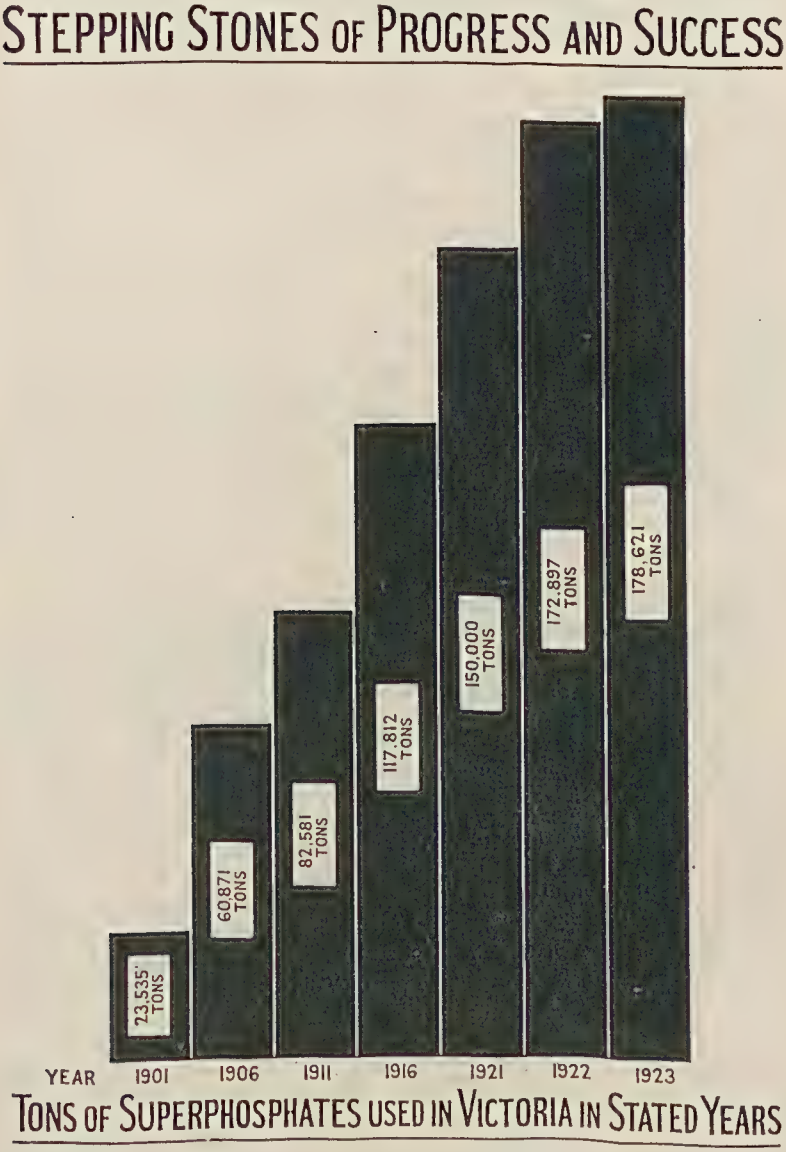
40009 Farmers used Fertilisers in 1923
Average Dressing in 1923, 100 lbs.

Four out of the five factories are at the present moment undergoing extensive remodelling and enlarging operations for the purpose of coping with the increased demand for superphosphate.

Raw Material.

A review of the figures showing the increased production of superphosphate in Victoria (see illustration above and on next page) naturally raises the question of the reserves in raw material—a matter of vital importance.

The materials necessary are high-grade rock phosphate (phosphate of calcium) and sulphuric acid (oil of vitriol). The raw materials used in the manufacture of sulphuric acid are sulphur and sodium nitrate (Chilian saltpetre). Sulphur occurs as a natural deposit in



Japan, the United States of America, and Sicily, where the bulk of the world's supply is at present obtained.

Sulphur also exists in combination with iron, as iron pyrites (mundic or "new chum gold") and in combination with other metals and

non-metals, such as arsenic, antimony, zinc, and lead, as complex refractory mineral sulphides, of which there are enormous deposits in various parts of Australia, particularly Broken Hill and Tasmania. Deposits of iron pyrites are general throughout the world. Enormous deposits in Spain (Spanish pyrites) have been extensively mined for the purpose of sulphuric acid manufacture.

With the sulphur mines of Sicily, America, and Japan, fortified with the known reserves of iron pyrites in Australia and Spain, not to mention the very important electrolytic zinc industry at Broken Hill and Tasmania, (the fundamental basis of which is the roasting of concentrated sulphides whereby, sulphur is eliminated and converted into sulphuric acid), the question of sulphuric acid may be immediately dismissed, for a shortage is inconceivable, inasmuch as the world's sulphur supplies have hardly yet been touched.

Chilian saltpetre, or sodium nitrate, is mined in Chili. No information is available as to reserves, but even should these deposits become exhausted, the chemist will quickly commercialize another process for obtaining the necessary nitrogen oxides or available oxygen. There is already in vogue a method of manufacturing sulphuric acid in which sodium nitrate is not used, of which something will be said later. Sulphur is one of the plentiful elements, but phosphorus—spoken of as phosphoric acid in this article—is one of the rarer elements, when viewed from the commercial stand-point.

Papers published in this journal in the months of August 1921 and March, 1922,* are not only of absorbing interest, but are particularly reassuring regarding the position of supplies of phosphate rock for superphosphate manufacture.

It will be remembered that early in the Great War, Nauru Island—a German possession in the Pacific Ocean—was seized by the Commonwealth Government, and, at the Peace Conference, it was agreed that the island should be controlled by the British Phosphate Commission, under what may be termed a partnership arrangement between England, New Zealand, and Australia. In a nutshell, the arrangement (for which the then Prime Minister of Australia, the Right Hon. W. M. Hughes, so ably contended) permits Australia to obtain her requirements of phosphate rock from the Commission for many generations—a business transaction fraught with great importance to Australia.

Nauru Island was discovered in 1798 by an Englishman named Fearn. Ninety years later (1888) it was annexed by Germany, and the name of the island, originally Pleasant Island, was changed to Nauru. It is situated close to the Equator, about midway, in a north-easterly direction, between New Guinea and the Marshall group, and about 2,200 miles from Sydney.

The nearest land, situated 165 miles to the eastward, is another phosphate island, viz., Ocean Island, (also controlled by the Commission). This island, which is owned by Great Britain, was discovered in 1804.

Although both islands were discovered more than 100 years ago, it was not until 1900 that phosphate rock was located on them, and then only by chance. The Pacific Phosphate Company, which formally con-

* *Nauru and Ocean Island*, by Harold B. Pope (Commissioner for Australia).

trolled the island deposits and whose whole interests were vested in the Pacific Islands trade, had an office and laboratory in Sydney. The manager of the company, on one of his many visits to Nauru, noticed a block of rock showing some peculiarity, and had it transferred to the Sydney office. Here it was pronounced by several geologists to be petrified wood and for years it was used to keep the door of the laboratory open. One day one of the chemists on the laboratory staff decided to test the discarded rock, and found that it was not petrified wood, but phosphate rock of very high quality.

After this development, which was practically equal to the discovery of a gold mine worth more than £200,000,000, it was decided to prospect the adjacent island (Ocean Island) with the result that another high-grade phosphate rock deposit was at once discovered. As Ocean Island was a British possession, operations were first commenced there, spreading later to Nauru.

The area of Nauru Island is 12 square miles, while that of Ocean Island is 4 square miles. The extent of high grade phosphate rock is enormous, and some 100,000,000 tons of probably the highest grade rock in the world have been computed to exist on the two small islands.

Under the terms of the *Nauru Island Agreement Act* 1919, Australia is entitled to 42,000,000 tons (i.e., assuming that the computed 100,000,000 tons of rock does exist), the approximate value of which is £80,000,000.

The purchase price of the deposits was £3,500,000 of which Australia paid £1,470,000.

Propositions of this description are few and far between, and the real value of this one to the Australian public—the farming community in particular—is so immense that it requires great courage indeed to plot out such a complicated calculation. It might be safely said that the purchase price is already written off, and the phosphate deposits have hardly been scratched.

As somewhere between 600,000 and 700,000 tons of superphosphates were produced in Australia in 1924, and as one ton of rock phosphate produces two tons of superphosphate, it follows that Australia at present requires about 300,000 tons of rock phosphate per annum, so that with an estimated entitled reserve of 42,000,000 tons, we have an assured supply for more than 100 years—an eminently satisfactory position.

Phosphate supply is a Federal matter, consequently the figures available as regards imports of rock phosphate are for the whole of the Commonwealth. It is computed, however, that roughly one-third of Australia's annual requirements of this material finds its way to Victoria.

The objective is to bring 500,000 tons of rock phosphate to Australia annually, which means that steamers laden with approximately 150,000 tons must enter Victorian waters and discharge their cargo on the wharfs of the local superphosphate companies; 150,000 tons of phosphate rock will produce approximately 300,000 tons of superphosphate, worth £1,500,000. Approximately 200,000 tons of "super" were used in Victoria in 1924, so that the objective should be quickly attained.

(*To be continued.*)

IRRIGATION EXPERIMENTS.

(Conducted by the Department of Agriculture and the State Rivers and Water Supply Commission in Co-operation.)

Interim Report by L. C. Bartels, B.Agr. Sc., Chief Irrigation Officer, Department of Agriculture.

(1) LUCERNE TOP-DRESSING PLOTS.

During the past few months several experiments to ascertain the value of top-dressing irrigated lucerne plots have been carried out at Swan Hill and Rochester by the Department of Agriculture and the State Rivers and Water Supply Commission in co-operation.

(a) Swan Hill.

The lay-out of the plots is as shown in the diagram on page 75. The area of each plot is one-fourteenth of an acre. The various manures were applied on the 21st August. The first cut was made on

Top-dressing Tests at Swan Hill.

the 29th October, and the hay raked and cocked; carting was done on the 3rd November. Favorable weather conditions prevailed during harvesting. The weighing was done on an apparatus designed for the Werribee plots, and proved entirely satisfactory.

In the main, the yields from this first cut confirm the results obtained at Werribee. The fact that the lime and gypsum were applied so late in the season would detract from their value, particularly since the lime and superphosphate were put on almost together. In the circumstances that obtained, however, no other course was open.

The most interesting feature of the results was the remarkable response to top-dressing with superphosphate; the contrast between the manured and unmanured plots was striking, and, as will be seen from the results, a heavy dressing of superphosphate resulted in the yield of lucerne hay being trebled.

Insoluble phosphates such as rock phosphate and bone fertilizer had less effect. This result is important, because many farmers are induced to use these materials because of the high phosphate content

and relatively low cost of the one and the so-called lasting quality of the other.

The land on the flats at Swan Hill seems to be "phosphate starved." The immediate and remarkable response to superphosphate makes it clear that liberal top-dressing may be adopted.

Plan of Experimental Plots at Swan Hill.

It is pleasing to note that many farmers have inspected these plots, and the ocular demonstration provided has in several cases led to the immediate ordering of manures.

The following table shows the yields from the various plots:—

Table I.—Lucerne Top-dressing Tests—Swan Hill Yields of Hay from First Cut.

Plot.	Yields of Air-dried Hay per Plot.	Moist Cont.	Yield per Acre. 15 per Cent. Moist.	Check Yields.	Percentage of Check Yields.	Increase due to Manure.
	Lb.	%	Cwt.	Cwt.	%	%
1. No manure	78	20·4	**9·1**	9·1	100	..
2. Superphosphate, 6 cwt. p. a. ..	294	30·5	**30·0**	(9·7)	309	209
3. Superphosphate, 3 cwt. p. a. ..	223	30·5	**22·7**	(10·3)	220	120
4. No manure	93	20·4	**10·9**	10·9	100	..
5. Superphosphate, 2 cwt. ..	203	34·8	**19·5**	(11·8)	165·3	65·3
6. Superphosphate, 4 cwt. (2 cwt. applied)	235	34·8	**22·6**	(12·8)	176·5	76·5
7. No manure	117	20·4	**13·7**	13·7	100	..
8. Superphosphate, 2 cwt.; lime, 1 ton	215	34·8	**20·6**	(13·8)	142	42
9. Superphosphate, 2 cwt.; gypsum, 30 cwt	250	34·8	**24·0**	(13·9)	172·6	72·6
10. No manure	123	22·6	**14·0**	14·0	100	..
11. Ground rock phosphate, 2½ cwt.	129	22·6	**14·7**	14·5)	101·4	1·4
12. Bone fertilizer, 2 cwt. ..	157	22·6	**17·9**	(15·1)	118·5	18·5
13. No manure	137	22·6	**15·6**	15·6	100	..

(b) Rochester.

Owing to unseasonable weather the first cut of the plots at Nanneella was not made until the 10th November. The hay was weighed on the 19th. Rain fell while it lay in the swathe.

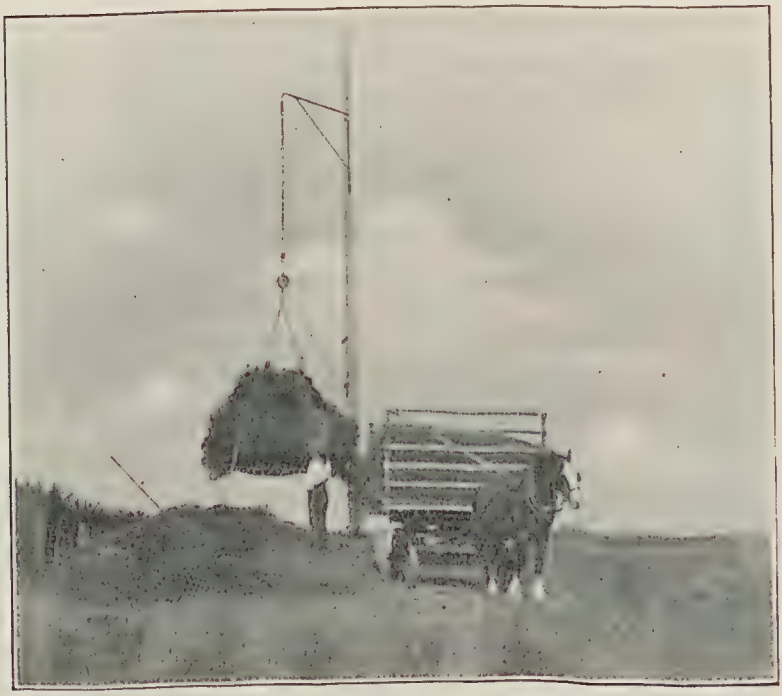
Table II.—Lucerne Top-dressing Tests—Rochester Yields of Hay from First Cut.

Area of Plot = 1–16 Acre.

Plot No.	Fertilizer applied.	Yield of Air-dried Hay per Plot.	Moist Cont. of Hay.	Yields of Hay per Acre. 15 % Moist.	Check Yields.	Percentage of Check Yields.	Increase due to Manure.
		Lb.	%	Cwt.	Cwt.	%	%
1	No manure	193	19·5	**26·05**	26·05	100	..
2	Superphosphate, 1 cwt. p. a.	216	19·5	**29·16**	(26·05)	112	12
3	Superphosphate, 2 cwt. p. a.	231	19·5	**31·2**	(26·05)	119·7	19·7
4	No manure	193	19·5	**26·05**	26·05	100	..
5	Superphosphate, 4 cwt. (2 cwt. applied) ..	213	19·5	**28·75**	(23·6)	121·8	21.8
6	Superphosphate, 2 cwt.; lime, 1 ton	214	19·5	**28·9**	(21·1)	137·0	37·0
7	No manure	138	19·5	**18·6**	18·6	100	..
8	Superphosphate, 2 cwt.; gypsum, 30 cwt. ..	211	19·5	**28·5**	(18·7)	152·4	52·4
9	Ground rock phosphate, 2 cwt. p. a.	146	19·5	**19·71**	(18·8)	104·8	4·8
10	No manure	140	19·5	**18·9**	18·9	100	..
11	Bone fertilizer, 2 cwt. p. a.	154	19·5	**20·8**	(18·8)	110·6	10·6
12	Superphosphate, 2 cwt. p. a.	190	19·5	**25·65**	(18·7)	137·2	37·2
13	No manure	138	19·5	**18·6**	18·6	100	..

Lucerne Hay in Cocks.

Each row is from one plot—one-fourteenth acre in area. The two outside plots were not top-dressed.



Weighing the Hay from the Lucerne Experimental Plots.

(2) FORAGE TESTS AT SWAN HILL.

In order to ascertain the value of different standard forages at Swan Hill a number of plots have been sown on the farm of Mr. G. McKerrow. The forages being tested are—(1) Teff Grass; (2) Sudan Grass; (3) Ambercane; (4) Saccaline; (5) Imphee; (6) Sorghum Saccharatum; (7) French White Millet; (8) African Millet; and (9) Japanese Millet. The several plots were planted on the 31st October under favorable conditions, and a good rain fell soon afterwards. The seeds germinated well. The plots face a road, and labels showing the names of the different crops will be fixed to the fence.

It is intended to make some pasture experiments on the land adjoining that on which the forages are being tested. This area is at present in bare fallow, and when inspected on the 31st October appeared to be relatively clean The grasses will be sown during the autumn.

THE WOOLLY APHIS PARASITE.

By G. T. Levick, B.Agr. Sc., Science Field Officer.

During the latter portion of last year a number of specimens of *Aphelinus mali*, the parasite of woolly aphis, were received by the Entomological Division of the Science Branch of the Department of Agriculture, from Dr. Tillyard, of the Cawthron Institute, New Zealand, and from Mr. J. H. Newman, the Government Entomologist of Western Australia.

In order to test their value, a small tree at the Burnley School of Horticulture, which was left unsprayed and became badly infested with woolly aphis, was completely covered with a buttercloth screen, and as the parasites came to hand they were liberated within the screen. They parasitized the woolly aphis, and at the beginning of this year the first brood began to hatch out. There was a sufficient number in this brood to enable a few of the very numerous requests for the *Aphelinus* to be satisfied, and batches were forwarded to Red Hill, Merricks, and Bacchus Marsh.

With Mr. Pilloud, the District Orchard Supervisor, I personally liberated numbers of the parasites in selected orchards in the Pakenham district on the 13th January.

The *Aphelinus* having parasitized practically the whole of the aphis on the small tree originally enclosed, a larger tree was covered, and the parasites set free thereon. From these it is hoped that sufficient will be bred for distribution to a much greater number of growers almost immediately.

A more detailed account of the parasites is in course of preparation, and will be published in an early number of this journal.

ELMORE CROP AND FALLOW COMPETITION, 1924.

Report of the Judge, J. E. Harrison, B.Ag.Sc., Science Field Officer.

Prices of wheat land have reached a high figure in a district like Elmore, and the task of getting better returns is always before the farmer who would receive fair interest on his capital and a reasonable return for his labour. The Crop and Fallow Competition, as well as being competitive, is designed to be educational in the production of paying crops, and Elmore does well to maintain the number of its entries. There were four more crops judged this year than last, but the entries decreased by two in the fallow section, probably owing to the wet season and the consequent difficulty of getting on the land.

That there is a relation between good crops and the best fallows will be apparent by a survey of the results of last year's fallow competition and this year's crop competition. The winning crop is on last year's winning fallow, and, in fact, the order of crop results is much the same as that of last year's fallow results. The lesson is obvious.

Generally speaking, the crops seen in Elmore and district looked promising at the time of inspection, but a proportion will suffer the ravages of take-all and "deadheads" and the competition of wild oats. The prevention of take-all and "deadheads" is dealt with in a later paragraph. Wild oats demand for their destruction constant cultivation of the fallows, the use of sheep to keep the fallows clean, late sowing, and quick germination of seed wheat. Dry pickling does not retard germination as does formalin, and the use of powdered copper carbonate is recommended.

Owing, in some part, to the wetness of the season, and the difficulty of getting on the land, many fallows lacked a scarifying or a cultivation that would have been to their advantage. There are times when all the resources of the farmer should be launched in a cultivation of his fallows. It is as important to stir the fallows at the right moment as to strip the wheat at the proper season, for delay means loss in either case, and perhaps the difference between profit and loss or a bank balance and an overdraft.

The question of overworking the soil, particularly the light soils west of Elmore, occupies the minds of many growers. The danger lies in powdering the surface soil so that it runs together and crusts after rain. Moreover, this danger appears to be greater in old fields than in new ground, or in ground that has been out of cultivation for a while, most likely because of the depletion of organic matter in the former. A crop of oats fed off to sheep as a fodder would help considerably in maintaining or restoring this organic matter. Oats is a cheap crop to sow, and the returns from sheep are good, and an area treated in this way each year until the whole of the farm has been covered would do much to improve the physical condition of these soils. In working them, the mouldboard plough and tyne implements only should be used, and disk implements avoided, because of the pulverizing action they have on the soils.

The 1924 Competition.

The Crops.

Mr. T. Houlden, sen., showed the winning crop, which gained 94 points. It was a dense, fairly even, rather tall crop of Graham wheat, and was standing well and ripening nicely. Throughout it promised well, was clean underfoot, and comparatively free from foreign heads. The crop had been sown with the combine drill in May, on a good fallow that was scarified before sowing. Sowing was made at the rate of 60 lb. of seed per acre, with 90 lb. of 18 per cent. superphosphate. The early sowing probably accounted for the few wild oats that were present, but Graham is rather tall in its young stages, and competes well with any wild oats that may come through. Moreover, the early crops this year appear to have escaped the rust that, owing to the abnormally wet spring, threatened the later crops, and Mr. Houlden's crop had a flag and straw that were bright and clean and free from disease.

The Home of Mr. D. J. Murphy, Runnymede.

Second place was won by Mr. J. Cheatley's crop of Federation with 91 points. This was a clean, healthy crop, standing well, and varied from dense near a creek to medium growth on the outside. Unfortunately it was rather uneven, and a few strangers were present, but it was comparatively free from disease.

Mr. J. J. Quinn submitted an excellent crop of Federation, which gained third place with 90 points. There was rather an abundance of foreign heads present, but the crop was well up in all other respects. The fallow upon which it was grown had been disked in December, 1923, and again at the end of March before sowing with the disk drill in early May of this year. Mr. Quinn had been compelled to use the disk freely because of the weed growth that took place during the late spring and the summer, but he prefers to use tyne implements if possible. A fairly heavy sowing was made with 75 lb. of seed, and an average of 1 cwt. of superphosphate per acre. A small area of about 1½ acres had been drilled in with 120 lb. of 22 per cent. superphosphate per

acre, and the crop appeared to be distinctly heavier; so much so that Mr. Quinn feels convinced of the value of heavier dressings of superphosphate.

Mr. D. J. Murphy's exhibit included 20 acres of Wannon wheat of good type and promising yield. This crop was not so tall as a crop of Federation alongside, and appeared to be standing better.

The remaining crops varied considerably. The presence of wild oats and thistles detracted a good deal from the appearance of some, while the low yields of others were entirely due to the presence of take-all and "dead-heads," which in the worst instances would account for several bags of grain to the acre.

The Fallows.

The fallows entered were in good order for the most part, but, as previously mentioned, were often in need of an extra cultivation.

The Winning Crop.
(Graham wheat—grown by Mr. T. Houlden, sen.)

First place, with 90 points, was awarded to Mr. H. F. Carmody, who exhibited a clean, well-worked fallow on red soil, with a firm seed-bed and good moisture content. The land had been ploughed towards the end of August, harrowed both ways, and since cultivated three times with a Massey cultivator.

Mr. W. E. McKee gained second place with 88 points for a well-worked fallow on a typical light soil of the Elmore district. The land, which had been out of cultivation for three years, was ploughed in June with the mouldboard plough to a depth of 4 inches. It was cross-harrowed a month later, then rolled and harrowed again about the end of July. Two workings were subsequently given it with the spring-tooth cultivator in September and November respectively. The land had broken down nicely into a good mulch, and presented an example of what could be done with a light soil.

Mr. D. J. Murphy's exhibits were both in good order, the land consisting of a buckshot gravel loam of uniform texture. The surface soil was mellow to the touch, and in a friable condition. The land had been ploughed in July-August, and given two strokes with the harrows in September.

Mr. T. Houlden's fallow was ploughed in August-September to a depth of 4½ to 5 inches, and was given two harrowings later. It was a rather refractory piece of mostly red soil, on which the water had lain and prevented the teams from getting on it.

Mr. D. I. Trewick's fallow had been ploughed and harrowed in July, harrowed twice, and then skim-ploughed in parts and disked in others. It was noticeably powdery where it had been disked. The soil varied somewhat, and in parts the subsoil appeared rather dry.

The remaining fallows were about equal in standard. Usually points were lost for deficient mulch, for the presence of weeds, and for irregularities in cultivation. Attention is drawn again to the

Mr. P. Rasmussen's Crop of Major.

remarks of Mr. H. A. Mullett in regard to depth of ploughing and working the fallow in his report on the Elmore Crop and Fallow Competition 1922, to be found in the *Journal of Agriculture* for January, 1923.

"Take-all" and "Deadheads."

Since the fungus, *Ophiobolus cariceti*, which causes the disease producing "take-all" and "deadheads" in wheat, can be minimized by suitable rotation of crops, a serious attack in a wheat crop must be attributed to wrong farming practice. The fungus is parasitic; it is one plant living on another plant, and, like all common plants that we know, bears fruit, which are called spores. These spores, however, are borne internally between the stem and the leaf sheath of the wheat plant, which must decay before the spores are liberated and can germinate. Unless a host such as wheat, barley grass, wallaby grass, or spear grass is present when the spores germinate, the parasite dies, and it is this characteristic which gives the farmer his means of

control. It has been found that the parasite rarely lives on the oat plant, and we regard the oat plant as practically immune from attack. The reason for an oat crop in a rotation therefore is readily apparent, for the spores of the fungus will die when they germinate and find no suitable host to live on. In fact, if only the oat plant is present, we may say that the spores of the fungus fall on stony ground.

If the oat crop be followed by a clean fallow, the fungus will be starved for two years. During this period the roots and stubble of diseased wheat plants will have ample time to decay and liberate the spores of the fungus. These will germinate and die, and the farmer may then expect a clean wheat crop the following season. From observations made this year, it would appear that two wheat crops can safely follow one crop of oats, but that more than two crops only lead to unnecessary risk.

Mr. Chas. Butcher's Crop of Federation Wheat.

In the foreground, lodged and diseased wheat grown on fallow after wheat. In the background, a healthy crop grown on fallow after oats.

Bunt or Stinking Smut.

Tilletia levis and *Tilletia tritici.*

The presence of bunt or stinking smut in the crops at Elmore occurred frequently, and it is noticed in the report of last year's competition that particular attention was then drawn to the same fact. Greater care evidently is necessary in the selection of clean seed and in pickling the selected seed. Seed that is visibly smutted, or smells of smut, should not be used under any circumstances when clean seed can be obtained. Further, it is a wise practice always to pickle in an open vessel and skim off the bunt balls, which float on the surface. Pickling in a bag does not allow of this, and the bunt balls remain in the seed. The spores which they contain are not all destroyed by pickling, and if the bunt ball be broken at any time, the spores

become scattered and the seed is re-infected. The possible extent of re-infection may be realized from the fact that there are as many spores in an average smut ball as there are grains in 5 or 6 bushels of wheat, or if they are scattered over an acre, each square foot will contain 75 spores.

By experiment it has been found that formalin is not so effective as bluestone in preventing re-infection; but, on the other hand, if the seed is not sown immediately after pickling, the bluestone has a more deleterious effect upon germination. The use of powdered copper carbonate as a dry pickle has gained favour in America, and as improved methods of dry pickling are introduced here, the possibility of an even more effective fungicide than bluestone or formalin is within sight. Since dry pickling can be carried out without injury to the seed any time before sowing, and since it does not delay nor destroy the germinating capacity of the grain to the same extent as either formalin or bluestone, its results should be carefully considered by the farmer.

Two ounces of copper carbonate per bushel are required, but the effectiveness of the powder will depend upon its purity, that is, the percentage of copper carbonate present.

Table I.—Best Crop of Forty Acres.

Name of Competitor.	Yield.	Purity of Type.	Evenness.	Absence of Disease.	Absence of Weeds.	Total.
Possible Points	**35**	**20**	**15**	**15**	**15**	**100**
T. Houlden, sen.	35	19	14	13	13	94
J. Cheatley	33	18	13	14	13	91
J. J. Quinn	34	17	13	13	13	90
D. J. Murphy	30	19	13	13	13	88
H. O. Cheatley	31	18	13	12	13	87
D. I. Trewick	32	19	13	9	13	86
Geo. Houlden	28	19	13	13	13	86
W. Murphy	25	18	13	10	14	80
Chas. Butcher	22	18	13	12	11	76
G. A. Ingram	25	17	12	10	10	74
Trewick and McKee ..	20	15	12	9	10	66

Table II.—Best Fallow of Forty Acres—To be judged in conjunction with the crop grown thereon in 1925.

Name of Competitor.	Moisture.	Mulch.	Cultivation.	Absence of Weeds.	Total.
Maximum Points	**25**	**25**	**25**	**25**	**100**
H. F. Carmody	22	22	22	24	90
W. E. McKee	21	22	23	22	88
D. J. Murphy (*a*) ..	21	21	22	23	87
D. J. Murphy (*b*) ..	21	21	22	22	86
T. Houlden, sen. ..	22	20	20	20	82
F. W. Dickens	19	20	20	22	81
D. I. Trewick	18	20	20	23	81
A. T. Dotell	21	17	19	22	79
P. Rasmussen	23	19	17	20	79
Archibald and McKee ..	20	17	20	21	78
M. McNamara	19	20	20	17	76

DONALD CROP AND FALLOW COMPETITION, 1924.

Report of the Judge, L. C. Bartels, Chief Irrigation Field Officer.

With each successive year the entrants in the Donald Crop and Fallow competitions seem to show better exhibits. The well-tilled fallows and dense crops shown now reflect a high standard of farming practice.

The careful fallowing carried out is an insurance against failure, and in a dry year its value will be demonstrated; but even under the favorable conditions prevailing during the last few years farmers have been repaid, and were it not for the toll of disease this year, it would

Mr. Pope's Comfortable Home and Well-kept Garden.

be safe to say that yields higher than any hitherto reached would have been attained. Clean cropping, liberal manuring, the use of selected seed, and careful pickling—all these factors have also had their influence.

The notes on the fallows and the records of treatment show that the conditions presented were not obtained without effort. The maintenance of the fallow land in a proper condition is regarded as very important, and no longer is this work made a matter of convenience, but whenever necessary a rapid stroke of the harrows is given. Many farmers have purchased tractors so that the working may be quickly and effectively carried out at any time.

No important changes in method were noted. Many farmers, by using 22 per cent. superphosphate instead of 18 per cent., and applying the same quantity as formerly, have increased the rate of manuring.

In the crops rust was much in evidence, but because of its late development its effects were not as serious as they might have been. A crop of Dollar wheat inspected was seriously affected, and its yield would be considerably reduced. Our most prolific wheats are susceptible to rust, but happily the seasonal conditions which promote the spread of the disease do not occur every year.

The widespread appearance of "take-all" was a notable and serious feature of this season's crops. It manifested itself mostly when the plants were approaching maturity, and "deadheads" were common. "Take-all" is a disease caused by a fungus which feeds on the tissues of the plant roots and lower part of the stem. It is probably present to a slight extent in every crop, but the fact that adjoining crops may be affected to a different extent shows that the disease is subject to controllable influences. Wheat grown after land has been in grass often suffers worst. It has been found that barley grass, wallaby grass, and

One of the Oldest Cabins in the Wimmera (on the Farm of Mr. George Pope).

silver grass are subject to the disease. The spores of the fungus live for a while on the affected grass or stubble which is ploughed in, and if sufficient moisture is available they will germinate. On clean fallow they find no hosts, and so they die. By the introduction of oats into a rotation the disease may be largely suppressed, because oats are immune from its attacks, but it is obvious that an undergrowth of barley grass, &c., should be kept out of the crop.

Dry working of the land promotes the disease, and late-sown crops seem less liable. It has been suggested that an abundance of nitrates in the soil prevents the disease; it is a fact that the conditions which favour nitrification in a fallow are the conditions found effective in combating the disease, and when strong and vigorous plants develop they are probably less subject to infection.

It is interesting to note that dry pickling—that is, the use of powdered copper carbonate as a fungicide for bunt—was tried by several farmers last season. Those who used it are convinced of its value, but its use was attended by unpleasant results because of the inhalation of the dust. This difficulty was met to some extent by doing the work in the open, where the breeze prevented the dust from gathering, but attention is drawn to the fact that suitable small machines for the process are now available. These reduce the dust trouble to a minimum.

On one farm only, a patch of Hoary Cress was seen. When established, this weed is so difficult to eradicate that every effort should be made to stamp it out while confined to small patches. One person met with said that good wheat had been grown in spite of it; that may be true, but much better wheat yields would be obtained without it, and even if any farmer were so negligent as to tolerate its spread he should not forget his obligations to his neighbours.

Comments on Competing Crops.

Crops on Previous Year's Fallow.

Mr. S. Coats grew a particularly good crop of Federation on the fallow exhibited in 1923. It was dense and relatively free from disease. Rust was in evidence, a natural sequence of the seasonal conditions, and a little loose smut and flag smut were noticed. There was a sprinkling of wild oats throughout, also some mustard. A few foreign ears showed above the crop.

The land on which the crop was grown was not sown in 1922. It was skim-ploughed in March, 1923, 3½ inches deep, harrowed in July, skimmed again in August, harrowed in October, and later in October spring-tooth cultivated, harrowed in November and left till February. It was then harrowed, spring-tooth cultivated in March, and in April harrowed again. All the cultivations subsequent to the first ploughing were light. The crop was sown with the "combine" at the end of June; the harrows followed the drill. The seed was pickled in formalin and sown at the rate of 75 lb. per acre, with 75 lb. of 22 per cent. superphosphate. A week after sowing the land was harrowed. Mr. Coats considers this a very beneficial operation, and he always does it if practicable. The crop was not fed off, and it made steady progress even during the dry spell experienced in early spring.

Mr. R. Adams presented a very good crop of Federation. The wheat was pure and free from weeds, except for a little mustard and an odd wild oat plant. Some flag smut showed, but no take-all was noticed. In places the crop had lodged somewhat.

In preparation for this crop the land was ploughed in March, 1923, to a depth of 3 inches, and left till July, when it was scarified 3 inches deep. It was given a second scarifying in July and a third in September. After that it was harrowed three times in September, October, and November. Sheep grazed the area continuously. When rain fell in December the land was again harrowed, and then it was left till the middle of February, when a heavy hail storm occurred; the land was then scarified 2½ inches deep. At the end of May it was again scarified to a similar depth. In the latter half of June the wheat

was sown with the rigid tyne "combine," with hoes spaced 3½ inches apart; the light harrows followed. 90 lb. of seed was sown, with 120 lb. of 18 per cent. superphosphate. The seed was formalin pickled.

Mr. McNally, manager for Mr. Adams, considers 90 lb. of seed a little too much, as the crop showed a tendency to fail in the dry spell. 120 lb. of manure is thought to be about the right amount to use. The ground was worked when wet to prevent take-all.

Mr. D. Wells showed a crop of Federation which was marred by the occurrence of take-all, and otherwise would have been a particularly good crop. It was relatively free from weeds, but had a proportion of "strangers" showing up. Rust was in evidence, and a little loose smut too. The land bore wheat in 1922. It was scarified in April, 1923, and left till September, when it was skim-ploughed 3½ inches deep and harrowed after ploughing; scarified in October and harrowed at the end of October, and again at the end of November. The land was again harrowed in December and January, scarified in February,

In Mr. Harry Pope's Crop.

harrowed and scarified again at the beginning of May. The wheat was sown in June with the "combine"; the harrows followed. From 75 to 90 lb. of formalin-pickled seed was put in, and Mr. Wells considers 90 lb. of seed per acre to be the correct rate of seeding. 102 lb. of 22 per cent. superphosphate was applied, which is the heaviest quantity Mr. Wells has used, and he is not sure that he has yet reached a profitable limit.

Mr. L. L. Bassett's exhibit "B" was a fairly heavy crop of Federation, and was superior to another exhibit in an adjoining paddock. It was heavier, cleaner, and freer from disease, particularly take-all. The land was scarified at the end of May, 1923, to a depth of 3 inches, and again in July to a similar depth. It was harrowed in August, scarified in September, harrowed in October, and spring-tooth cultivated in early November. After rain in February it was again harrowed, and in March after rain it was stirred slightly with the scarifier and

harrows attached. It was harrowed at the beginning of April, and again harrowed soon after rain in May. The crop was sown during the second and third weeks of June with the "combine," with harrows attached. 85 lb. of seed was put in, and 105 lb. of 22 per cent. superphosphate. The land bearing this crop was fallowed earlier than the adjoining paddock referred to, and Mr. Bassett attributes the comparative freedom from take-all to the fact that it was not dry worked, whereas the other paddock was. The land was not ploughed.

In the red ground section, Mr. W. Sproat exhibited a splendid crop of Wannon which promised to yield heavily. The wheat was comparatively pure. Odd plants were affected with take-all, and a little loose smut and flag smut were showing. The crop was very level, but misses in drilling marred its appearance. There was a sprinkling of wild oats throughout, and a little undergrowth. The land on which this crop was grown has been cropped only twice previously, about 1907 and 1908. It was broken up in July, 1923, when soft enough, to a depth of 4 inches, and harrowed immediately afterwards. Scarified and harrowed in October. Details of subsequent workings were not available, but the crop was sown at the beginning of June, 72 lb. of dry pickled seed and 112 lb. of 22 per cent. superphosphate being put in, and the land was harrowed after sowing. The crop was fed off till 1st September to repress the vigorous early growth.

Mr. H. Hancock's crop on the red ground was of moderate density. Plants affected with take-all were noticed throughout; a few wild oats showed up, and there was a little undergrowth, poppy, ironweed, &c. The land had been ploughed at the end of July, 1923, 4 inches deep, and broken down with the planker in August; skim-ploughed at the end of September, scarified in October with the harrows following, and harrowed in November. After harvest the land was spring-tooth cultivated 4 inches deep and sown at the end of May with the rigid tyne "combine." Seed was sown at the rate of 80 lb. per acre, with 90 lb. of 22 per cent. superphosphate. The wheat was dry pickled, and this seemed to promote the early growth of the crop.

The Fallow Section.

The area of fallow shown by Mr. R. Reseigh was of particular merit. It was very clean, with a nice even mulch 2½ inches deep. A little unburnt stubble and a suggestion of ridging of the seed bed were the only features detracting from its character. In 1923 the land was in wheat; the stubble was burnt in April, and a clean burn was effected. At the end of April the land was scarified 2½ inches deep and left till the first week in August, when it was again scarified and harrowed a week later. After a fortnight's interval another harrowing was given. At the beginning of October the land was scarified, and two weeks later harrowed. During the second week of November another scarifying was given and the harrows followed on. This was the first occasion on which the scarifier alone had been used for cultivation, and was in the nature of a trial. The practice is to scarify as shallowly as possible, providing the weeds are killed.

Mr. Chas. Bassett showed a very good piece of fallow, clean with a good mulch overlying a compact and moist seed bed. It was a little

uneven in places. The stubble of the preceding wheat crop was burnt in May and the land skim-ploughed 2 inches deep. It was harrowed in July, and at the end of July again skim-ploughed 3½ inches deep. At the end of September the land was scarified 2½ inches deep, the harrows being attached to the scarifier. In October the fallow was cross-cultivated with the spring-tooth cultivator and harrows attached, and in November this was repeated. Mr. Bassett believes in making the cultivations as light as practicable, provided weeds are kept down, and would prefer harrowing alone if it were effective.

An Oat Silo on the Farm of Mr. F. Young—a Progressive Donald Farmer.

Mr. L. L. Bassett's fallow exhibit was a good one, with a nice mulch of 2½ inches over a good seed bed. A few wild oats showed throughout and some stubble was scattered over the surface. The scarifier was the main implement used, and Mr. Bassett considers that it does good work and does it quickly. The last crop was wheat in 1923. After the stubble was burnt the land was scarified 3 inches deep early in April, harrowed in early June, and again at the end of June. It was scarified 2½ inches deep in August and then harrowed, scarified again early in October, harrowed at the end of October, and cross-harrowed in the middle of November.

The fallow shown by Mr. A. Clifford was a very good one—clean, with a good mulch, which was a bit too deep and rough in patches, and showing a little rubbish on the surface. The seed-bed was level and moist. The fallow followed wheat in 1923. The stubble was burnt, and the land skim-ploughed in March and early April 3 inches deep, and harrowed after ploughing. It was left till July, and subsequently cultivated four times with the rigid tyne "combine" at intervals, and harrowed between cultivations. Each working was to combat weeds. The cultivator is considered sufficiently effective if it keeps down weeds, and the plough is not used more than necessary. Frequent harrowing is done if required.

Mr. H. Hancock's red ground fallow was on land which had been out of cultivation for six years. In June it was ploughed 4 inches deep and harrowed after ploughing, harrowed again and skim-ploughed in July; it was left till October, and then cultivated 4 inches deep with the "combine"; this was repeated in November.

The skim-plough is preferred for working the fallows, and seldom is the cultivation less than 4 inches. Despite this, the fallow submitted had a knobby mulch of the right depth overlying a firm seed-bed, which was, however, irregular in places. The land was fairly clean.

As usual at Donald, the arrangements for judging were well made, and I have to express my thanks to the officials of the Society and to the farmers visited for their hospitality.

Table I.—Points Awarded for Crop Grown on Fallow Exhibited in 1923.

Competitor.	Apparent Yield.	Trueness to Type.	Freedom from Disease.	Absence of Weeds.	Evenness.	Total.
Possible points ..	**35**	**20**	**15**	**15**	**15**	**100**
Black Ground.						
S. Coats	35	18	14	13½	13½	94
R. Reseigh	35	19	14	10	14	92
R. Adams	34	19	13½	12½	13	92
L. L. Bassett ("B" exhibit)	31	19	14	13	14	91
D. Wells	33	18	12	13½	14	90½
H. Pope	31	19	14	12	13	89
H. Hancock	32	19	12	13	13	89
C. W. Bassett ..	30	18	14	12	14	88
G. Flett	33	19	12	10	13	87
F. Young	29	18	14	11½	13	85½
J. T. Dickeson ..	28	19	13	13	12½	85½
L. L. Bassett ("A" exhibit)	27	19	12½	12	13½	84
J. Lobb	31	10	14	14	13	82
Red Ground.						
W. Sproat & Co. ..	35	19	14	13	12½	93½
H. Hancock	27	19	12	13	13	84

Aggregate Points Awarded for 1923 Fallow and 1924 Crop.

Competitor.	Fallow, 1923.	Crop, 1924.	Aggregate.
Maximum Points	**100**	**100**	**200**
BLACK GROUND.			
S. Coats	95	94	189
R. Adams	94	92	186
D. Wells	93½	90½	184
L. L. Bassett ("B" exhibit)	92½	91	183½
R. Reseigh	91½	92	183½
G. Flett	96	87	183
C. Bassett	94	88	182
H. Hancock	92	89	181
J. T. Dickeson ("A" exhibit)	93	85½	178½
F. Young	90½	85½	176
L. L. Bassett ("A" exhibit)	89½	84	173½
J. Lobb	91½	81	172½
H. S. Pope	82	89	171
T. Dickeson	96	(not shown)	
T. Connellan ("B" exhibit)	93½	,,	
J. Whelan	92½	,,	
S. J. Westerland	91	,,	
E. Hancock	90½	,,	
G. Pope	90½	,,	
T. Connellan ("A" exhibit)	90½	,,	
J. T. Dickeson ("B" exhibit)	89	,,	
RED GROUND.			
W. Sproat & Co.	88	93½	181½
H. Hancock	90	84	174

TABLE II.—POINTS AWARDED IN FALLOW SECTION.

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation.	Total.
Maximum Points	**25**	**25**	**25**	**25**	**100**
BLACK GROUND.					
R. Reseigh	25	25	25	24	99
C. W. Bassett	25	24	24	24	97
L. L. Bassett	25	24	23	23½	95½
A. Clifford	25	23	24	23	95
G. Flett	25	23	24	23	95
C. Coates	25	23	25	22	95
F. Young	25	22½	24	23	94½
W. J. Bassett	25	23	24	21	93
R. Adams	25	23	22½	22½	93
Deane Wells	25	22½	23½	21	92
W. Pope	25	20½	24	21½	91
L. Wells	25	22	24	20	91
H. S. Pope	25	21	23	21	90
J. Coates	25	21	22½	21	89½
C. Tonkin	25	21½	21	21½	89
RED GROUND.					
H. Hancock	25	23	23½	22½	94
G. Pope	23	19	24	19	85
—. Bould	23	20	20	20	83
W. Sproat & Co.	22	15	23	17	77

VALUE OF MINERALS IN DIET OF COWS.

Covering a period of over a quarter of a century numerous tests and continual observation have well established the fact that minerals are of great importance in the metabolism of the dairy cow. The chemical action of the mineral salts assist in the digestion and assimilation of the proteins, carbohydrates, fats, and crude fibres.

A cow producing only an average amount of milk requires no minerals except those in her feed, unless the quality of the feed is very poor. Grains, grasses, hays, beets or beet pulp, and by-products of grain, such as bran, linseed meal, vacuum-dried distillers' grains and peanut meal are usually high in mineral constituents and form a food of a highly digestible character.

Hays cut when quite young or just before blooming, as a rule contain the greatest amount of minerals. Hays not properly cured lose many of their mineral salts. Forty-five per cent. of the mineral salts can be washed out of alfalfa hay by heavy rains, and 25 per cent. can be washed out of clover hay.

The variety of the beet has much to do with the percentage of minerals which it contains, is the opinion of Oscar Erf, Professor of Dairying, Ohio State University. The little red beet is higher in ash than the larger beets, and is better for milk production than the sugar beet. Carrots fed in limited quantities are of benefit in supplying minerals.

As a rule concentrates are low in minerals, and, owing to this, high producing cows are not able to obtain a sufficient amount of minerals from their feed without overbalancing the other constituents. The higher the production the greater the amount of mineral salts that must be added to the ration.

Care must be taken in determining the proper minerals, the amount to be fed to each cow and the method of feeding. Minerals should not be fed in a concentrated form, but should be sprinkled over moist hays, silage or grain feeds. Mr. Monroe has found that a small quantity of lime sprinkled over the silage forms calcium lactate, which is desirable for milk production. Even the salt, to be of the greatest benefit, should be mixed with the feed.

The following minerals have been used to the greatest extent and with the best results: Calcium phosphate, calcium carbonate, magnesium sulphate, sodium, sodium phosphate, iodine of potassium, sulphur præcipitatum, black sulphide of antimony, arsenates, iron sulphates, bromides, and sodium chloride. Bone meal and hard wood ashes have been found to give the best results of any minerals, with the exception, of course, of salt. As the production increases it is often advisable to reinforce these with sulphur, potassium iodide, and other minerals. The effect of minerals in the dairy ration is not directly evident in the increased flow of milk. The improvement in the physical condition of the animal is more apparent, and due to this the milk flow is eventually increased.

—[Reprinted from *The Dairy*, England, 21st June, 1924.]

NEW WHEATS IN THE MALLEE.

Results of Official Tests.

Last year twenty new crossbred wheats raised at the Research Farm, Werribee, and at Longerenong College were named and released by the Department of Agriculture for further test on the Government experimental plots located on private farms in the principal wheat districts. The wheats had already given a good account of themselves at the State Farms, and it was desired to ascertain their behaviour in other districts in comparison with the varieties usually grown there.

The tests for the Mallee were made at Carwarp, on the farm of Mr. P. G. Stewart, M.H.R. The results showed that a number of the new crossbreds eclipsed Federation in yield, and are likely to prove themselves important additions to wheats suitable for the driest part of the Victorian wheat belt.

The wheat is tested in a series of plots, each one-quarter of an acre in area. The plots were sown during the first week in June on well worked fallow, with 50 lb. of graded seed and 60 lb. of superphosphate per acre. The season on the whole was a dry one. The soil is a good, red, sandy loam, characteristic of a large area of new Mallee country.

Results of Variety Wheat Tests, Carwarp, 1924.

	Bushels per acre.
Sepoy (Currawa x Indian 4 x Federation)—New crossbred	26.8
Penny	25.3
Gallipoli 58	25.2
Rajah (Indian E x Telfords)—New crossbred	25.1
Mac's White	24.9
Yandilla King	24.9
Confederation (Federation x Federation)—New crossbred	24.3
Ranee (Indian F x Federation)—New crossbred	24.1
Omrah (New crossbred)	23.5
Currawa	23.3
Mogul (New crossbred)	22.8
Gluyas	22.7
Suvla (New crossbred)	22.1
Marmora (New crossbred)	22.1
Mahdi (New crossbred)	22.0
Parsee (New crossbred)	21.7
Empire (New crossbred)	21.5
Capitol (New crossbred	21.2
Ghurka	20.8
Federation	20.7
Mahratta (New crossbred)	20.5
Sovereign (New crossbred)	20.1
Alliance (New crossbred)	18.8
Nabob (New crossbred)	17.5
Nizam (New crossbred)	17.0

Note.—The plot on which Nizam was sown was subject to some interference from a row of young trees. Last year Nizam gave the highest yield.

The following table gives the average yields for the past two seasons at Carwarp, of those varieties giving better yields than Federation:—

	Bushels per acre.		Bushels per acre.
Sepoy	25.5	Mahratta ...	22.9
Confederation ...	24.5	Rajah ...	22.6
Yandilla King ...	24.1	Ranee ...	22.6
Ghurka ...	23.7	Nizam ...	22.4
Omrah ...	23.4	Federation ...	21.9
Mogul	23.0		

Sepoy, the new crossbred which has done so well, is a bronze chaffed wheat with bold, compact, clubby heads. It stands well, has a good, clean straw, and this year appeared to be very free from rust.

Gallipoli 58/1 is a selection from the original Gallipoli which proved very tough to strip, and has therefore been discarded. Gallipoli 58/1 has square, bronze-coloured heads, and is slightly awned.

Rajah is an early wheat with bold, creamy heads.

Confederation is a white chaffed wheat, with a bold, square head. The straw is of medium height. It is earlier than Federation.

Official Tests in the Wimmera.

Splendid yields have been harvested on the departmental experimental wheat field conducted by Mr. W. E. Dahlenburg at Salisbury, near Nhill, in the Wimmera. One plot returned 57 bushels per acre, and another 56.8 bushels. The whole field of 6 acres averaged 50 bushels an acre.

The results indicate that the new crossbred wheats raised by the Department of Agriculture, particularly Nizam, Gallipoli 58, Marmora, and Krithia have justified the high opinions previously formed of them by the Department.

Eight varieties of wheat and two of oats were sown on well-worked, fallowed, black-clay loam, typical of large areas in the Wimmera. Each plot was one-third of an acre in area. Seeding took place on the 31st May, with 75 lb. of graded seed wheat per acre and 1 cwt. of superphosphate. The oats was sown at the rate of 50 lb. per acre, without any fertilizer. The yields were as follow:—

	Bush. per acre.
WHEAT—	
Nizam	57.0
Gallipoli 58/1	56.8
Marmora	54.2
Krithia	53.0
Federation	52.5
Wannon	51.1
Empire	49.0
Rajah	48.4
OATS—	
Palestine	49.0
Algerian	44.2

Nizam is the product of a cross made between Indian 17 and Federation wheats. It is a vigorous mid-season wheat, of moderate height, with bald, compact, velvety ears, somewhat clubbed at the apex. Nizam

gave the highest yield last year in a test with twenty other wheats at the Carwarp experimental plots in the North Mallee.

Gallipoli 58/1 is a selection from the original Gallipoli, which proved tough to strip. The new selection is satisfactory in that respect.

The Palestine oats, which has given a higher yield than Algerian, was introduced from Palestine by Dr. Cherry a few years ago. It is a short grower, and is very early—ripening about ten days ahead of Algerian. This oats is likely to prove of value to farmers in the Wimmera and Mallee, because it should enable the harvest to be commenced earlier. While the short straw is a disadvantage from the hay-growers' point of view, it is no detriment when grain production alone is desired, and it should be a decided advantage for growing on fallowed land in the North, where the crops are frequently so heavy that they lodge badly.

A WELL-MANAGED DAIRY FARM.

By W. J. Yuill, Dairy Supervisor.

"Riverdale," the farm of Messrs. Joseph Walker & Sons, on the Middle Creek, at the foot of the Jumbuk hills, at Yinnar South, is, perhaps, unique in Victoria, in that an area of 185 acres provides for three families—the father and two sons having homes on the farm.

The land was purchased in 1887 by Mr. Walker, senior, who had had some fifteen years' experience in farm work in England, Canada, and the United States, and who is a life member of the English Royal Agricultural Society. Undoubtedly, Mr. Walker's early training has been a very valuable asset in making "Riverdale" the successful farm it is to-day. During recent years, Mr. Walker has ceased to take an active interest in the work of the place, and the management has passed to his sons, Messrs. Charles and Martin F. Walker.

The Main Features of a Good Dairy Farm.

Dairy farming may be likened to a chain, in that it is only as strong as the weakest link. Many dairy farms have serious weaknesses, which nullify much good work.

The main features or "links" in "the dairy chain" are:—

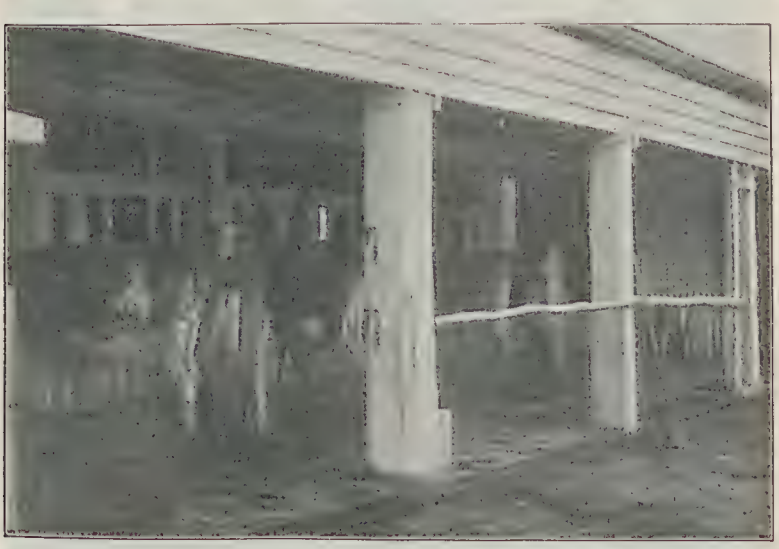
(1) Good pastures of suitable grasses for milk production.
(2) A permanent water supply, and adequate fodder reserves.
(3) A tested herd, with available records of each cow's milk and butter fat production.
(4) A "quality" pure-bred herd sire.
(5) A system of pasture dressing, and drainage of low areas.
(6) Well laid out dairy buildings and yards, where dirt can be reduced to a minimum, and where the herd can be handled with ease and satisfaction.
(7) Satisfactory arrangement for cleansing dairy utensils, and the care and storage of cream.

Fodder Reserves and Pasture at "Riverdale."

The weakest link at "Riverdale" is much stronger than is usually seen even on the farms of the more progressive dairy farmers, viz., fodder reserves.

Few dairymen can boast of substantial reserves of fodder for winter feeding, or of a cropping system that will overcome what is fast being recognized as the most difficult period of the year, viz., that period when the pasture, though plentiful, fails to hold the milk flow. In South Gippsland this is approximately from mid-December to mid-February. By the middle of February supplies of green maize are becoming available, but the milk flow has usually receded too far to be even appreciably increased.

Green maize alone will hold the milk flow, but will rarely increase it. Liberal feeding of maize in the autumn greatly improves the condi-



View of Cow-shed and Bailing Yard, which, together with the Receiving Yard, are Bricked throughout. Six thousand Bricks were used in this work.

tion of the herd, and for this reason alone no dairy-farmer should neglect to grow maize. Japanese millet is fast coming into favour as a means of keeping up the milk flow during the lean period, but even with this fodder seasonal influences cannot be overcome.

Mr. Walker is strongly of the opinion that the only alternative is a reserve of maize or oaten silage, which can be fed with requisite amounts of concentrates, and in the near future two concrete silos will be erected at "Riverdale."

With the advent of the rabbit came the necessity of wire-netting the farm, and 3½ miles of netting was erected in 1914, before the pests became numerous.

When the property was first purchased by Mr. Walker a small herd of from 20 to 30 dairy cows was its maximum carrying capacity.

At this time the growing of cabbages and potatoes for the Melbourne market was also carried on, and they had to be carted by bullock teams to the Yinnar railway station. The dairy herd to-day consists of 60 grade and pure-bred Jersey cows, which are kept entirely on the farm. With young stock, the number of cattle pastured on the

Mr. Joseph Walker testing the Skim Milk. This Outfit has been in use since 1900.

185 acres approximates 100. Admiration of the Walkers for their farm management is widespread in South Gippsland, as is their reputation for their herd's high butter-fat production.

Splendid pastures are to be seen throughout the property. They consist mainly of rye (*Lolium perenne*), cocksfoot (*Dactylis glomerata*),

crested dogtail (*Cynosurus cristatus*), and a wealth of Trifoliums, which include Dutch white (*T. repens*), red (*T. pratense*), alysike (*T. hybridum*), strawberry (*T. fragiferum*), and many of the Medic species, better known as trefoils. This prolific growth of clovers and trefoils is undoubtedly the result of liberal topdressings of lime and superphosphates. One-quarter of the farm is top-dressed annually with 2 cwt. of superphosphates per acre, and experience has shown that the richest land gives the best response to artificial manuring. As far back as the nineties, artificial manure was used on the pasture; but for the last fifteen years the system mentioned has been in practice.

An opinion held at "Riverdale" is that every good cow requires at least one bag of manure on her pasture each year. Much talk occurred in the early days of the farm of Mr. Walker's practice of "throwing manure on the grass." On two occasions a 10-ton truck

"Jessie XXIX. of Melrose" and "Daphne 6th of Ferndale"—recently-purchased Pure-bred Cows.

of lime was used on ploughed land, with good general results, and remarkable growths of clover were observed in the stubbles where lime had been used. The luxuriant clover on the limed paddocks contrasted remarkably with the very scanty growth on the unlimed areas. It is only the heavy cost of freight and cartage of lime that prevents it from being used more extensively.

Drainage.

A 7-chain line of 6-inch piping, which was laid to the creek, through a 7-foot bank, has proved successful in draining one extensive low-lying area of the farm. Several long subsidiary lines of 3-inch and 4-inch piping do effective work in leading to the main drain. One particularly wet area is ploughed into high lands, and the water carried to the main drain by piping laid in the furrows.

What would otherwise have been an area of sour feeding, or rushes and sedges, has been effectively transformed into a splendid sole of nutritious feeding, rye and clover predominating. Over 3,000 pipes have been laid, and further attention will be given to this work, results having justified the cost of piping, cartage, and labour. After heavy rains, the main drain flows a "head" of water, which would otherwise be soaking in the low areas, killing out all but water weeds and rushes.

Water Supply.

A splendid natural water supply exists. The creek traverses the whole of the farm, and affords running water for all stock throughout the year.

Gippsland streams usually have difficult approaches and boggy bottoms. The opposite holds good at "Riverdale," where easy approaches exist, together with a gravel bed.

No. 32—3 years old, 6,462 lbs. Milk, 5·72 Test, 369½ lbs. Butter-fat. Rose—a heavy Producer—433½ lbs. Butter-fat.

Herd Test Work.

About the year 1899, Mr. Walker purchased a Babcock testing outfit, and the herd has been systematically tested since that date. The Walker family are foundation members of the Yinnar District Herd Testing Association. They state that the testing work is done more satisfactorily by the association, and that their time can be utilized to better advantage in the cultivation of crops and the feeding of the herd. In striking contrast to some farmers, who say that they cannot afford to join an association, the Messrs. Walker claim that they cannot afford to be outside one, and that year by year their herd records are becoming more useful to them.

After experimenting with various dairy breeds, and crossing them to procure the good points of each, the Jersey breed was ultimately considered to fill all requirements. A Jersey bull bred by Mr. Peppin, of Lock, was obtained, and a small line of Jerseys was purchased about the same time. When this little herd was tested it was found to contain

only one "quality" cow, and this animal left behind her a strain which now heads the "Riverdale" herd (Rose, 430 lb. of butter-fat).

Eventually bulls which left their mark on this farm were purchased. In 1908, "Gay Fox," ex "Gaity," by "Maderia's Fox," by "Carnation Fox," by "Flying Fox," was secured from Mr. T. E. Ellis of Kyabram. This bull left some splendid deep-framed heavy-milking cows, "No. 11" and "No. 60" being an indication of this bull's value.

	No. 11.			No. 60.		
Year.	Milk.	Average Test.	Butter-fat.	Milk.	Average Test.	Butter-fat.
	lbs.		lbs.	lbs.		lbs.
1922 ..	8,055	5·19	402	5,716	6·08	325
1923 ..	6,878	5·44	375	5,621	5·73	322
1924 ..	8,419	5·14	434	6,759	5·34	361

In 1912, "Jessemia's Twylish of Kingsvale," bred by Mr. J. Anderson, of Lyndhurst, was purchased. His dam was advertised as having a 6 per cent. test. This proved to be a reliable guide, for his progeny have been exceptionally high testers. "Jessemia's Twylish" was by "Larkspur's 3rd Twylish," by "Lord Twylish" (imp.), his dam being "Jessemia of King's Vale."

Since the inauguration of the Government Standard Test the official record of the dam's production is the basis on which the selection of a new herd sire is determined. "Graceful Lad. of Lesterfield," by "Magnet's Maitland," ex "Graceful Duchess XI." (395) was the first bull purchased under these conditions. "Graceful Duchess" produced 505 lb. of butter-fat in 1920, and in the previous year gave 8,3314 lb. of milk, testing 6.4 7per cent. = 53 8lb. of butter-fat.

"Graceful Lad" has proved a very successful sire. His thirteen 2-year-old heifers last year averaged 256 lb. butter-fat, while nine 3-year-olds averaged 270 lb. of butter-fat. The leading 3-year-old produced 369 lb. of butter-fat, and the best 2-year-old produced 295 lb. of fat in the official period of 273 days.

"Butterwinks II. of Mt. Eccles" is the coming herd sire. His dam, "Tiddlewinks II. of Holmswood," established a Jersey record for production in 1919. Her 10,850 lb. of milk and 576.91 lb. of butter-fat was made as a 4-year-old cow. "Butterwinks" should at least attain the high standard of the previous sire, combining as he does the blood of "Audrey Lord Twylish" (his dam's sire and grandsire) with that of "Matilda's Nobel," through his sire "Retford Stirling."

Recently some pure-bred cows have been purchased, viz., "Ringtail of Tarnpir" (483 lb. B.F.), "Tiny of Meadow Vale" (407 lb. B.F.), "Jessie XXIX. of Melrose," and "Daphne 6th of Ferndale." These should form the nucleus of a heavy-producing pure-bred herd.

Evidence of the value of using bulls from high-testing heavy-milking cows is seen in the increased production of the herd, which has been

heavily culled, and built up with young stock, 39 per cent. of the herd at present being 2 and 3-year-old heifers.

The following table shows the herd averages for the years 1922, 1923, and 1924:—

Year.	No. of Cows.	Average Quantity of Milk from Each.	Average Test.	Average Butter-fat.
		lbs.		lbs.
1922	53	4,786½	5·03	241
1923	53	4,903	5·17	254
1924	59	5,344	5·24	280

It will be noted that the average production of the herd is being steadily increased, despite the high percentage of young cows and an

Group of Two-year-old Heifers by "Graceful Lad of Lesterfield." Thirteen of the "Riverdale" Heifers averaged 254 lbs. Butter-fat in 273 Days.

increase in the herd numbers. The herd is machine milked, by an overhead "Ridd" milking plant, converted from a bucket plant. The buckets are still used on the day of the tester's visit to the farm.

Many dairymen affirm that the same quantity of milk cannot be produced by machine-milking as by hand-milking, and many butter factory managers fear the "rubber flavour." The faults will usually be found with the operator. The fact is evident that in these days of high cost milking the herd by machines is the only solution of the hired labour problem, and satisfactory results can be received if attention be given to details. This is borne out by the authentic figures of the District Herd Testing Association, on the one hand, while the books of the Moe Co-operative Butter Factory prove that all the cream received from "Riverdale" for years past has been classified as "superfine."

Attention to Utensils and Care of Cream.

Unless care and attention are given to details from the time the milk leaves the cow until the cream reaches the factory, the best results cannot be expected.

At "Riverdale" the milking machines are taken to pieces every day and thoroughly cleansed, the brush being run through each inflation and pipe, which are then sterilized with a jet of steam, and afterwards left in lime water until milking time.

The cream is cooled as it leaves the separator, and is stored in a dairy detached from all milking sheds. The skim milk is pumped away to the piggery as it comes from the separator. A break in the pipe line can be used to secure milk for the calves.

Building Stack of Ensilage.

Treatment of Young Stock.

Calves receive attention from birth. New milk is given for the first fourteen days; they are then fed on skim milk and a quarter of a pound of Meggitt's meal porridge, and a cup of lime water is given each calf daily. The young stock are kept growing until they calve.

During winter chaff and about ¾ lb. of meal is fed to the young stock in the paddocks, in kerosene tins cut lengthwise.

The opinion held at "Riverdale" is that well-grown calves make well-grown cows. Such stock sell well, and milk well.

Mr. Walker finds that the reliable information from the Herd Test Association has greatly increased the sales of surplus young stock, which are in keen demand, at a figure greatly in excess of market prices for

most stock of a similar age. Opportunity is also taken by beginners, to secure a young bull from good-grade cows—by the pedigreed stud bull.

The cows are not named, as on the average farm, but are known by a "number," which is tattooed in the ear, and, for the tester's convenience, also branded on the rump.

Pigs.

Every facility for carrying out the pig-work has been availed of. The skim-milk is pumped across from the separator house to a large receiver, where it is used in conjunction with the various feeding materials. The feed is stored at the sties—not at some distant part of the farm, as is too often the case. The Tamworth and British Black cross is much fancied at "Riverdale." Last year's sales amounted to £290.

A Few Interesting Points.

During the past year, 60 tons of maize was converted into stack ensilage. The laborious work attached to getting the maize on to the stack was in this instance overcome in a simple manner. With the aid of trace chains, it was kept together on the sledges in large bundles, which were hoisted up singly by means of an improvised derrick. (See illustration on previous page.) The stack was built on the bank of the creek. By using a long pole "heeled" into the trunk of a large tree, and swinging it by means of pulleys from strong branches higher up, the hard work of stacking was overcome. The pole was lowered as required, and the bundles attached and hoisted, and then swung over on to the stack. The sides of the stack are always liberally trimmed on completing the work, and the trimmings placed on the top of the stack, and sufficient weight is then applied, with the result that very little waste occurs.

The bull is not a "free agent," but is kept under control, being housed and hand-fed. In this way the maximum value may be obtained from the extra amount of money invested in a good bull.

When the herd is dehorned, as at "Riverdale," extensive yarding space is not required, and there is an absence of the continual "churning" movement which occurs when one or two "boss" cows attack the more timid ones on the flank and udders, often causing permanent damage by horn-thrusts.

The whole of the receiving and bailing yards at "Riverdale" are bricked throughout, there being some 6,000 bricks in the yards and cow-bails. Such work, though costly, if well done, will last a lifetime, and is undoubtedly a valuable asset, while the value of comfort to the animals and owner alike, particularly through the winter and spring months, cannot be estimated.

A strong farm team is essential where large supplies of fodder must be grown. The team and equipment, together with the well-pruned orchard, carefully tended vegetable gardens, and well laid out piggeries, make "Riverdale" one of the most up-to-date and best-managed dairy farms that has ever been visited by the writer.

APRICOT GROWING.

(Continued from page 724, Vol. XXII.)

By W. H. Nicholls, Orchard Supervisor.

Diseases.

"Shot Hole."

There are only a few fungus diseases that attack the apricot, but heavy losses are sustained annually by the ravages of the most common of them, "Shot Hole," which affects both the fruit and foliage. Its appearance is shown by small brown patches on the young leaves. As these patches develop they become more marked, and eventually fall away, leaving small round holes in the leaves, which then have the appearance of being riddled with shot, hence the common name "Shot Hole." Later on the young fruits are liable to be infested, and as the brown patches develop they frequently become confluent, thus causing the scab which makes the fruit unsightly and unsaleable. The affected fruit is often ill-formed owing to the disease arresting development.

In addition to the failure of the season's crop, the trees are sometimes so weakened by the loss of leaves that future crops are jeopardized owing to the immaturity of buds and weakened growth generally.

An application of a fungicidal spray, such as Bordeaux Mixture, Copper-Soda or Burgundy Mixture, Lime-Sulphur, or Bluestone alone will check the disease, if applied at the right time.

Spray at full strength should be applied when two-thirds of the leaves have fallen in autumn, and again just before the buds show pink, and if the climatic conditions are conducive to fungoid growths, a further application at half strength should be made just as the fruits are free from the husks.

None of the above sprays will cure "Shot Hole," but any one of them will prevent it if spraying be done at the right time, provided, of course, that the mixture is correctly made and the application thorough.

Bordeaux Mixture.

To make Bordeaux Mixture, the following formula is advised:—

6 lbs. bluestone (copper sulphate).
4 lbs. quicklime.
40 gallons water.

Dissolve the bluestone in 20 gallons of water (a wooden or copper vessel is necessary) by suspending it in a piece of hessian overnight or until it is dissolved. If required immediately, it may be dissolved by stirring in boiling water at the rate of 1 gallon to 2 lbs. bluestone. The lime is slaked by placing it in a tub or bucket and adding at first

just sufficient water to cover the bottom of the vessel, allowing it to remain until the lime has broken down to powder. Water should then be added slowly, and the mixture must be stirred all the time until milk of lime is obtained, when it should be made up to 20 gallons. The two solutions must then be poured simultaneously into the spray vat, the streams crossing, and the agitator should be kept working until a perfect emulsion results.

It is advisable to use only selected lime for spraying purposes; such is obtainable from several firms, and as it is sold in air-tight tins, it will be found economical.

"Stock" Bordeaux Mixture.

If a fairly large area is to be sprayed, a stock solution can be made, and will be found advantageous in many ways; but mainly because uniformity will be obtained in the mixture in each vat, and delays will be obviated at each "fill up."

For each pound of bluestone use 1 gallon of water, and for each pound of lime allow half a gallon of water. These solutions must be kept separate until required, and will last indefinitely. When making up the mixture from "stock solution," it should be remembered that each gallon of bluestone is equivalent to 1 lb., and each gallon of lime milk to 2 lb. To mix a quantity, proceed as follows:—Take 6 gallons of bluestone, and make up to 20 gallons with water, and bring 2 gallons of lime milk slowly up to 20 gallons by the addition of water; then pour both lots evenly into the spray vat, stirring well all the time. The mixture should be tested with either Phenolpthalien or Litmus paper. It is fit for use when a neutral result is obtained; this condition is shown by a change of colour to a light pink in the case of Phenolpthalien. A deep pink will indicate acidity, and more lime should be added, a little at a time, until neutrality is obtained. The neutral shade with Litmus will be heliotrope. A record should be kept of the amount of lime used, so that the necessity of testing further mixtures from that particular stock solution may be obviated, and much time will thus be saved.

Copper-Soda or Burgundy Mixture.

Copper-Soda or Burgundy Mixture is made in a similar manner, but 8 lb. washing soda is used instead of lime.

Lime-Sulphur Mixture.

Lime-Sulphur, also an effective fungicide, is applied at the pinking stage at a strength of 1 gallon to 12 gallons of water, and later if necessary at a strength of 1 gallon to 30 gallons of water.

Bluestone Solution.

A Bluestone solution made up with 1 lb. Bluestone to 25 gallons water is sometimes used in the drier parts of the state, but its use is not recommended on account of its being so easily washed off. If we take the cost of materials into consideration it will be found that

Bordeaux, Burgundy, or Lime-Sulphur mixtures cost but very little more than Bluestone, and have the great advantage of being "fixed" to a great extent.

The addition of casein at the rate of 4 oz. to 40 gallons of mixture will increase the spreading power. It should be mixed while dry with a few handfuls of slaked lime and stirred into half a gallon of water until dissolved. For Copper-Soda Mixture, casein should be dissolved in a pint of water in which 2 oz. of washing soda has been dissolved. In both instances the mixtures must be alkaline.

Bark Blotch (*Polystictus Cinnabariscus*).

This fungus attacks the stems and branches of the tree. Its appearance is shown by reddish-coloured growths appearing on different parts of the tree. The bark gradually becomes decayed at the place of infection, and the tree eventually dies. Affected trees should be sprayed with Bordeaux, Copper-Soda, or Lime-Sulphur mixture.

Brown Rot (*Sclerotinia Cinerea*).

Although this disease has been known for a long time, it has made its appearance in serious outbreaks in Victoria only during the last few years, and has caused huge losses to the growers of stone fruits. Experiments carried out by officers of the Department of Agriculture have proved that it can be controlled by thorough and efficient spraying.

The fungus induces rot of the fruit on young twigs and blighting of the blossoms; but the greatest damage is done to the fruit, often causing a loss of half the crop. The disease first appears as small, brown, circular spots, which rapidly enlarge until the entire fruit is involved in decay. The affected area does not become sunken until the larger portion of the fruit is decayed; then a shrinking takes place, and the entire mass dies and becomes mummified.

After the spots have reached half an inch in diameter, or sometimes earlier, the fungus growing in the tissues of the fruit breaks through the skin, producing small greyish tufts, consisting of a great many fungus threads, on which the summer spores are born. These tufts become so numerous as to give the affected portion of the fruit a greyish appearance. The spores thus produced are blown by the wind and carried by insects, so that a serious outbreak of the disease in an orchard may result from one infested fruit. Finding lodgment on the fruit, the spores germinate, provided sufficient moisture is present, and throw out microscopic threads which find their way into the flesh, where they branch and spread in every direction. Under favorable conditions, the diseased spot may begin to appear on the surface 24 hours after infection takes place. Most of the infected fruit falls to the ground, but some of it hangs to the tree in a mummified condition until the following season. The fungus lives during the winter in these "mummies," and produces spores for the infection of the new crop. The fungus may also attack the blossoms and twigs, and cause more or less damage. The diseased blossoms turn brown and dry up

on the trees, and may remain attached to the twigs for a large portion of the summer. An abundance of spores is produced on the dead blossoms, and will infect the young fruits.

This disease causes most damage during moist weather, and, unless spraying has been efficiently carried out, much damage will ensue. The spray not only prevents the entrance of the Brown Rot fungus, but aids to some extent in toughening the skin of the fruit. Insects which puncture the skin play an important part in causing outbreaks of Brown Rot, consequently these should be kept well under control in all districts where the disease is present.

The application of Bordeaux Mixture (6.4.40) is recommended. It should be applied when the trees are dormant in winter. A second spray of the same strength should be given when the trees are at the pink stage, and another of half strength (6.4.80) some three or four weeks later.

Root Rot (*Armellaria Mellea*).

This fungus attacks the roots, and is therefore somewhat difficult to treat. It appears like the strands of a bootlace wound round the roots, and bark stripped from affected trees has a soft white appearance. This fungus is sometimes found on native timber, and where grubbing of the trees on the orchard site is not efficiently done, roots left in the ground may act as a host, and so spread the disease to the young fruit trees.

In winter, the roots of any trees attacked by root-rot should be bared and Bordeaux Paste applied. The formula for making the paste is:—

1½ lb. Bluestone.
1 lb. Quicklime.
2 gallons water.

Other remedies are:—

Bordeaux Mixture, 6—4—50, sprayed on roots.
Sulphate of Iron, 1 lb. in 4 gallons of water, sprayed on roots.

Trees badly affected should be grubbed out and burned on the spot.

Fortunately, the application of sprays at the "pinking stage" controls many other fungus diseases perhaps less important than those mentioned, but careful watching on the part of the grower is necessary, so that any signs of trouble may be observed, and control measures immediately adopted.

(To be continued.)

PLANT IMMIGRANTS.

By J. W. Audas, F.L.S., and P. F. Morris, Assistants, National Herbarium.

New Plants Recorded During 1923 and 1924.

For the thirteen years preceding the year 1923, the average rate of entry of introduced plants spreading to arable land was six per year. The present list of such plants received during the years 1923 and 1924, and recorded for the first time as growing wild, shows that the average has increased to 8.5 per year. Some have escaped from gardens, and others have sprung from impurities in seed mixtures from abroad. All of them may become serious weeds. Some of them may have a slight fodder value.

Antholyza aethiopica, L., "African Corn-flag."—A tall-branching perennial, not unlike "The Bugle Lily," which is proclaimed for Victoria. Both are members of the *Irideae* (Iris family). The plant has a corm or "bulb" at the base, which makes it difficult to eradicate.

Found growing along the railway enclosure at St. Albans by Mr. A. J. Tadgell.

Bromus rubens, L., "Red Brome Grass."—This grass has been introduced from the Mediterranean regions. It has slight fodder value when young, but is practically useless when older. The sharp awns of the flower-head may cause irritation to the gums of stock.

Collected at Mt. William, near Lancefield, by Mr. A. J. Tadgell.

Corydalis capnoides, Wahl., "Corydale."—A member of the *Fumariaceae,* the "Fumitory" family, which it closely resembles in the leaf. It has no known economic value. It is a native of Europe and Asia.

Collected at Mornington, and forwarded by the Vermin and Noxious Weeds Branch.

Erodium Botrys, Bert., "Needle Stork's Bill" (*Geraniaceae*).—A native of the Mediterranean regions. It has slight fodder value, and in New South Wales native members of this genus are looked upon as excellent fodder.

Collected by Rev. A. C. Gates, Lara.

Iris germanica, L. (white form), "The German Iris or common Flag."—A well-known garden plant, that is capable of becoming a serious weed.

Found growing wild along the Buffalo River, Myrtleford, by J. W. Audas.

Leycestria formosa, Wall., "Himalayan Honeysuckle" (*Caprifoliaceae*).—An escape from gardens that is spreading at Limonite and Noojee, Gippsland.

Collector, J. W. Audas.

Lycopsis arvensis, L., "Bugloss."—A member of the *Boraginaceae,* "Paterson's Curse" family. A native of Europe that has spread and become a weed in many countries, where it has given trouble in corn crops.

Found at Sorrento by Mr. W. J. Harris.

Lychnis divaricata, Reich., "Spreading Lychnis" (*Caryophyllaceae*).—A native of Sicily, often grown in gardens, found growing wild at Lara by Rev. A. C. Gates. Several members of this genus are bad weeds.

Malva muschata, Linn., "Musk Mallow" (*Malvaceae*).—This handsome European plant was found growing in a lucerne crop at Gormandale, and also at Nilma. It is a perennial garden plant, and contains an essential oil. It also supplies slight fodder. Being a perennial, speedy eradication is advisable.

Onopordon acaulon, L., "Stemless Onopordon" (*Compositae*).—A native of the Mediterranean regions, introduced into Victoria, probably from South Australia, where it has been growing for several years. The leaves of this thistle lie flat on the ground; the flowers are sessile in the centre of the rosette of leaves. As the plant belongs to the same genus as the proclaimed plant "Scotch Thistle" *Onopordon Acanthium,* it is quite likely that it will spread if not speedily eradicated.

Found at Murrayville by Mr. Gordon, State Research Farm.

Oxalis hirta, L., "Hairy Wood Sorrel" (*Oxalidaceae*).—A bulbous perennial plant, native to South Africa, which has all the characteristics of a serious weed.

Collected at Ellinbank by G. H. F. Baker, Department of Agriculture.

Plantago patagonica, Jacq. (*P. aristata*) "Bracted Plantain".—A hairy green annual belonging to the *Plantaginaceae* (Plantain family), native to North and South America, where it is an extremely bad weed. *The Weed Flora of Iowa,* United States of America, states, "This is one of the worst weeds that can get on the farm."

Found growing at Lilydale, by G. H. F. Baker, Department of Agriculture.

Reseda lutea, L., "Cut-leaved Mignonette" (*Resedaceae*).—An erect annual or biennial, from 1 to 2 feet high, with deeply-divided leaves. The plant is native to Europe, and occurs in waste places, especially in limestone districts. *R. luteola,* L., "The Weld or Wild Mignonette," an allied plant, is becoming a bad weed in Victoria, and is proclaimed for three shires.

Found at Geelong and Williamstown by Messrs. H. B. Williamson and E. J. Cane.

Rubus Idaeus, Linn., "Raspberry."—Like its congener, the "Blackberry," this plant has escaped from cultivation, the seed having probably been carried by birds. The blackberry is a serious pest, and the raspberry may equal it if allowed to spread.

Found growing profusely at Anderson's Creek, Beenak, by J. W. Audas.

Sieglingia decumbens, Bernh. (*Triodia decumbens,* Beauv.) "Heath Grass."—A native of Europe, North Africa, and West Asia. This grass has fodder value, and grows on poor soil in England.

Specimen received from the "Better Farming Train," per Mr. H. A. Mullett, Toora, Victoria.

Solanum villosum, Lam., "Hairy Nightshade."—Closely allied to *S. nigrum,* the "Black Nightshade," a serious weed, and believed to be poisonous to stock. The plant may be looked upon with suspicion, as the genus Solanum supplies many serious weeds and poison plants.

Tradescantia virginica, L., "Common Spiderwort" (*Commelynaceae*).—A native of North America. Often cultivated in gardens, whence it has escaped at Anderson's Creek, Beenak.

Collector: J. W. Audas.

General Principles of Weed Eradication.

It is imperative that plants having little or no economic value to the farmer, which show that they are capable of spreading, should be destroyed before they become acclimatized. The following hints should be borne in mind:—

1. Do not allow weeds to ripen seeds. 2. Cut before flowering, pile and burn, or, better still, kill whilst in the seedling stage by inducing autumn germination by shallow ploughing and then harrowing. Many weeds are winter-killed and a spring cultivation will rid the ground of the second crop. 3. Above all, sow clean seed. 4. If possible, run sheep on weed-infested areas. 5. Practice rotation of crops or fallowing. 6. Top-dress pastures and do not overstock. 7. Be suspicious of any new plant in your district. Ask an expert for advice. 8. Remember that weeds cause a direct loss to yourself and to your country. 6. Remember the old adage that "one years seeding means seven years' weeding."

Weeds rob crops of moisture and mineral and other food elements necessary for growth; they harbour insects and fungal diseases; they smother a crop or maybe pull it down and thus prevent it being harvested; they reduce the fertility of the soil, and may poison stock and even man himself.

MINERALS FOR LIVE STOCK.

All farm live stock absolutely need a certain amount of common salt in the ration. This viewpoint is so common that it would be difficult to find many farmers who were not using common salt for their live stock. It is necessary to supply salt because the crops and feeds fed to live stock are very low in the element chlorine, and it is this that common salt must furnish the body. Common salt makes hydrochloric acid in the stomach of the animal, and this is absolutely essential for proper digestion.

Experiments have shown that the dairy cow, for example, cannot get along indefinitely without an extra amount of common salt. Dr. S. M. Babcock carried on trials at the Wisconsin station twenty years ago, and showed that if the cow were fed on a ration that did not have added salt, finally her flow of milk would diminish and her general condition become impaired. The evidence is clear that farmers must feed common salt to all live stock unless some of the feeds they are purchasing already contain an extra supply of it.

Stock may be allowed free access to salt, they may be fed salt at regular intervals, or it may be mixed with their feed. The most common plan with all stock except dairy cows and poultry is to allow them free access to it.

Dairy cows should receive at least 1 oz. of salt a head daily. A plan followed by many dairy farmers is to mix ½ lb. to 1 lb. of salt

with each 100 lb. of concentrates, and then, in addition, to provide salt so the cows can have access to it and take what they wish.

Forms of iodine used in treating animals to prevent goitre are potassium iodide and sodium iodide, whichever is the cheaper of these two forms of iodine. Just how large a dosage of iodine is necessary to prevent goitre or hairlessness has not yet been definitely determined. However, experiments have shown that a daily dose of 2 grains of potassium or sodium iodide throughout the gestation period will prevent the trouble. This small daily dose is sufficient for cows, sows, ewes, or mares. Cows and mares will receive during their gestation period a total quantity of somewhat over 1 oz. of the compound, while ewes and sows will receive approximately ½ oz., as their gestation periods are much shorter. It is entirely possible that a smaller daily dose would be sufficient to prevent the trouble, or else treatment during only the latter part of the gestation period. However, further experiments are necessary to decide the point.

It is rather difficult to mix the dry potassium or sodium iodide with the feed, as the quantity of the substance necessary is so small. Therefore, Dr. J. W. Kalkus, of the Washington Experiment Station, recommends that the potassium iodide be dissolved in water in the proportion of 1 oz. of the substance to a gallon of water. One tablespoonful of such a solution will contain approximately 2 grains of the compound, and is, therefore, a daily dose. For horses or cows fed in the stable it can be conveniently sprinkled on the feed each day. In the case of sows, the solution can be mixed with the feed, swill, or water, adding one tablespoonful for each animal in the pen.

The mere supply of calcium (lime) or phosphorus in the ration is not enough to prevent rickets, for bone formation requires not only an ample supply of lime and an ample supply of phosphorus, but also a vitamine that assists in assimilating calcium and phosphorus. Without the vitamine only a limited use is made of the calcium and phosphorus in the ration.

Since such animals as cows, sheep, and horses get minerals, particularly lime, almost wholly from roughage, its mineral content is important. It has been demonstrated very clearly at this station that a cow receiving a dry roughage low in lime content and supplemented with grains will usually abort her calf. This means not only loss of the calf, but also lowered milk production. The same thing has happened time and time again when wheat or oat straw was fed, as these are generally low in lime. On the other hand, where to such a ration a certain amount of lime salts was added, there was marked improvement in the offspring, but they were not as thrifty as those produced when the roughage was a natural one rich in lime, such as clover or alfalfa hay. The stems and leaves of forage plants are variable in lime content, dependent upon the soil supply. If the soil is acid and low in lime, then plants, or part of plants, like timothy hay, blue grass, corn stover, or corn fodder, will have a relatively small amount of lime. Even red clover grown on an acid soil will be lower in lime than if grown upon a lime-rich soil; but, nevertheless, the lime content of a legume plant, such as clover or alfalfa, will always be relatively high. Its minimum is high, and if it cannot get the minimum it ceases to grow.

—Prof. E. B. Hart, in *Live Stock Journal*, England.

STALLION REGISTER, 1924-25,

Under the "Horse Breeding Act 1919."

Part II*.—Registrations prior to 31st August, 1924.

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1062	Gallant Jock ..	5	Draught ..	W. Hooper ..	Bingeluke
1241	Galtee	4	Thoroughbred	T. Walsh ..	Seaton-road, Glenmaggie
179	Garfield Junior ..	A	Pony ..	F. B. Turner ..	Glenthompson
467	Gay Bold	5	Draught ..	V. Coates ..	Mt. Jeffcott
1125	Gay Garland ..	A	Draught ..	Mr. Macrae ..	St. Albans
947	,, Gordon ..	A	Pony ..	A. Dalziel ..	Main-st.,Stawell
618	,, Lad	A	Draught ..	J. Archibald ..	Sale
419	,, Voyage ..	A	Light ..	P. Beaumont ..	Ouyen
869	,, Willie ..	3	Draught ..	Starritt Bros. ..	N. W. Mooroopna
1234	General Favourite ..	2	,, ..	W. Hall ..	c/o Mrs. Reid, Drummartin-st., Sunshine
1137	,, Gordon ..	5	Light ..	Sharp & Taylor	City-road,South Melbourne
420	,, Harvey ..	A	Draught ..	Koschitzke Bros.	Bangerang
565	,, Jess ..	3	,, ..	D. L. Bodey ..	Jung
151	,, Keith ..	A	,, ..	P. J. McLinden	Salisbury West
693	,, Link ..	3	,, ..	J. H. Echardt ..	Beulah
952	,, McDonald ..	A	,, ..	J. Martin ..	E. Gowar
53	,, Ribbonwood	A	Light ..	Mr. Phyland ..	Watson's Terrace, Ascot Vale
194	,, Scotch ..	A	Draught ..	J. Parle ..	Carwarp
52	Gentleman Jack ..	A	Light ..	R. Matchett ..	Bendigo
325	Gillie's Son ..	A	Draught ..	Boyd Bros. ..	Minhamite
967	Ginger	A	Light ..	D. McLean ..	Chiltern
955	Gisborne	A	Draught ..	C. E. Umbers ..	Sea Lake
659	Glen Aire ..	A	Light ..	J. P. McKenzie ..	Weeaproinah
930	,, Alto ..	5	Pony ..	P. V. Frauenfelder	Wodonga
614	,, Arthur ..	6	Draught ..	A. Arnold ..	Warracknabeal
421	,, ,, ..	A	,, ..	C. T. Henderson	Weatherboard
471	,, Direct ..	5	Light ..	P. Whitechurch	Box 168, Mildura
1003	Glengyle	2	Pony ..	R. Trimble ..	Stud Farm, Rutherglen
466	Glen Isla	3	Draught ..	F. Perry ..	Corack L.B.
1171	Glenmarkie ..	A	,, ..	O. Baynes ..	Yea
1161	Glenmooney ..	A	Light ..	L. P. Walsh ..	Mildura
164	Glenmore	A	,, ..	P. Murphy ..	Bindi P.O.
1133	Glenscott	A	Draught ..	W. Walls ..	Berrimal
843	Glenspean ..	A	Thoroughbred	E. Raffelt ..	Sheep Hills
251	Glyn Trustful ..	A	Pony ..	Roth Bros. ..	Ensay P.O.
899	Glynne	A	Light ..	G. Collis, jun. ..	Alberton
918	Gold Dust ..	A	,, ..	Mrs. M. Birst ..	Stradbroke
596	,, Mauritius ..	6	,, ..	C. Potts ..	Crosbie-road, Murrumbeena
993	,, Tuck ..	A	Thoroughbred	J. J. G. Barns ..	Euroa P.O.

* Part I. was printed in this *Journal* for January, 1925.

STALLION REGISTER, 1924-25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
651	Golden Action ..	A	Light ..	H. W. Newson ..	514 Albion-st., Brunswick
691	,, Hue ..	A	,, ..	A. W. Cardinal ..	Nalangil P.O.
1138	,, Simmer ..	3	Pony ..	M. O'Brien ..	Commercial Stables, Hamilton
655	Goldenwood ..	A	Light ..	J. T. Owens ..	Cooma
966	Goldie	A	,, ..	W. J. Minns ..	Melton South
211	Gossoon Bells ..	A	,, ..	W. Leach ..	Rheola
40	Governor Bracey ..	A	Pony ..	H. T. Vause ..	Lyons
595	Grampian Lad ..	5	Draught ..	A. Richards ..	Gymbowen
656	Grattan Bells ..	A	Light ..	T. Shearwood ..	Dooen North
1041	Grattan's Voyage ..	A	,, ..	Busst & Glasheen	Huntly P.O.
278	Gratton Junior ..	A	,, ..	W. J. Parish ..	Horsham
23	Grey Marvin ..	A	Light ..	J. S. W. Uren ..	Krowera
1147	Guy Fox	A	,, ..	H. Maddison ..	Mongan's Bridge, Dederang
157	,, Todd ..	A	,, ..	W. Williams ..	McMahon-street, St. Arnaud
657	Gwalia Caesar ..	A	Pony ..	E. McKoy ..	Wodonga
658	Hafren Sensation ..	A	,, ..	Miss B. Bruce-Reid	Bundoora
370	Halcyon	A	Light ..	J. M. Maclellan	241 Dandenong-rd., Windsor
210	Hamboltonian Direct	A	,, ..	R. S. Wright ..	Yarraberb P.O.
812	Hames	A	,, ..	A. Dean ..	Tinamba
914	Hamilton Emulator	A	Pony ..	Todd Bros. ..	Willenabrina North
610	,, Hero ..	A	Draught ..	E. P. Quirk ..	Woomelang
84	Hamiltonian ..	A	,, ..	A. Steele ..	Woomelang
613	Hampton Ben ..	A	,, ..	P. Seelander ..	Warracknabeal
508	Handyman ..	A	Thoroughbred	G. Wells ..	Riggs Creek, Euroa
507	Happy Binnia ..	A	Light ..	W. Nolte ..	Wando
156	,, Jack ..	A	Pony ..	E. Shephard ..	Winslow
915	Harimoy	A	Light ..	A. Bolton ..	Lake Charm
666	Harmattan ..	A	Thoroughbred	C. Tobin ..	Eskdale
1258	Harold Direct ..	A	Light ..	F. A. Cox ..	2 Western-street, Geelong
22	Harry Almont ..	A	,, ..	S. Pemberton ..	Wedderburn
1134	,, Rose ..	A	,, ..	J. W. Smith ..	Elmore
506	Hayston	A	Thoroughbred	A. E. Barker ..	Moama, N.S.W.
922	Heather Jock ..	4	Draught ..	D. Williamson ..	Wendouree
1024	,, King ..	A	Pony ..	J. Morrison ..	Hamilton
566	Hemsdale ..	3	Draught ..	G. Francis ..	Lower Norton Creek L.B.
1051	Herdsman's Treasure	5	,, ..	W. J. Cobbledick	Undera
369	Hermes of Shetland Heights	A	Pony ..	J. M. Maclellan ..	241 Dandenong-rd., Windsor
252	Hero	A	,, ..	T. Park ..	Nth. Wonthaggi
722	,, ...	A	Draught ..	J. Carruthers ..	Picola West
14	,, II.	A	Pony ..	Greaves Bros. ..	Yannathan
532	,, Laddie ..	A	Draught ..	H. F. Robinson	Kerang
721	Herward Junior ..	A	Light ..	J. A. Haebich ..	Bittern
229	Hiawatha of New Zealand	A	Draught ..	M. Kelly, jun. ..	Nullawil
1096	Hieratus	A	Thoroughbred	E. C. Luckie ..	Bowser
723	High Commander ..	A	Draught ..	Griffiths Bros. ..	Greta West

STALLION REGISTER, 1924–25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
950	High Commissioner	A	Draught ..	M. Regan ..	Thorpdale
724	,, Degree ..	A	,, ..	Schroeder Bros.	Murrayville
1240	,, Grade ..	3	,, ..	J. Sewell ..	Smeaton
186	,, Honor ..	A	,, ..	C. H. Feldtman	Major Plains
180	Highland Cleve ..	A	Light ..	M. L. V. Greatz	Irymple
289	,, Fancy ..	A	Draught ..	G. Hildebrand ..	Leitchville
1159	,, Willie ..	2	,, ..	R. L. McRae ..	Warracknabeal
664	Highlander ..	3	,, ..	S. Clemens ..	Serpentine
505	Hillhead Knight ..	A	,, ..	R. E. Krause ..	Kinimakatka
685	His Majesty ..	A	,, ..	M. Frawley ..	Leigh Creek
341	Hivites	A	Thoroughbred	F. N. Heywood	Toongabbie
1242	Homeward Bound ..	5	Light ..	McCarney & Cato	Tinamba
725	Honest Cleve ..	A	,, ..	W. Eichler ..	Chillingollah
965	,, Wilks ..	A	,, ..	H. D. Adams ..	Yielima
504	Honest King ..	A	Light ..	O'Loughlin Bros.	Leongatha
503	Hoprig	A	Thoroughbred	R. F. Carmody ..	Everton
102	Hullabaloo ..	A	Light ..	G. Bennett ..	Chinkapook
1214	Humoresque ..	6	Pony ..	A. C. Bayley ..	Willaura
202	Huon's Joy ..	6	,, ..	E. C. Wade ..	Bronzewing
1081	I am here ..	A	,, ..	W. Studman ..	Lucknow
89	Ian McClelland ..	A	Draught ..	H. Naylor ..	Roseberry East
271	Ideal Footprint ..	A	,, ..	F. S. Falkiner & Sons	Widgiewa, N.S.W.
1287	,, Toy	3	Pony ..	M. McLeod ..	Condah Swamp
1144	Idris	3	Light ..	S. Winter-Cook ..	Hamilton
954	Imperial Crown ..	A	,, ..	T. G. Maher ..	Purnim
776	Interest	A	Pony ..	A. Kennedy ..	Arcadia
7	Invincible ..	A	Draught ..	T. Collins ..	Nathalia
41	Ipidi	A	Thoroughbred	A. Kennedy ..	Arcadia
1101	Irak	4	Pony ..	S. Perrins ..	Nagambie
42	Ironsides	A	Thoroughbred	M. Hore ..	Talgarno
220	Jack	A	Draught ..	W. Fanning ..	Wyuna East
567	,, Dale ..	3	,, ..	H. W. Lang ..	Yongala, S.A.
376	,, Marsh ..	A	Thoroughbred	J. F. McDonald ..	Bacchus Marsh
538	,, Style ..	A	Light ..	P. McEntee ..	Cudgee
546	,, Tar	5	Draught ..	J. J. C. Dufty ..	Lorquon West
340	James Osterley ..	A	Light ..	A. Huddleston ..	132 Gheringhap-st., Sth Geelong
1012	Jimmie Mac ..	2	Draught ..	H. P. McDougall	Bundalong
984	Jimmy Direct ..	6	Light ..	J. Isaac ..	Inglewood
165	Jinghal King ..	A	Thoroughbred	J. Reid ..	c/o C. Brown, Ararat
433	J. H. S.	A	Light ..	W. Wilson ..	P.B., Swan Hill
100	Jock	A	Draught ..	G. T. Wolstenholme	Milawa
1216	,, Cedric ..	5	,, ..	J. W. Gardner ..	Cavendish
461	,, MacGregor ..	3	,, ..	Reseigh & Flockart	Culgoa
1088	,, McCraw ..	A	,, ..	Williamson & Coghill	Wendouree
526	John Brigham Last	A	Pony ..	Boyd & Taafe ..	Camperdown
203	,, Douglas ..	A	Draught ..	V. P. Dahlenburg	Winian East
24	Jolly Malster ..	A	Thoroughbred	Defence Department	Victoria Barracks, Melb.
1115	Jumbo	A	Pony ..	C. & W. Kallawk	Pomborneit
726	Justice	6	Draught ..	Sir Rupert T. Clarke	Lancefield Junction

Stallion Register, 1924–25—*continued.*

Cert. No.	Name.	Age	Class.	Owner.	Address.
		Yrs.			
166	Kelly	A	Pony ..	S. Pianta ..	Murtoa
225	Kelm Pride ..	A	Draught ..	C. Lippiatt ..	Scotsburn
1074	Kelm's Best ..	A	.. ..	J. Bright ..	Mirboo
727	,, Pride ..	A	.. ..	J. Dugdale ..	Myrniong
238	Kelmscott II. ..	A	,, ..	A. W. Lackman ..	C/o Agricultural Society, Murrayville.
870	Kelso Prince ..	3	.. ..	Rasheed & McDermott	Adelaide, S.A.
871	,, Willie ..	3	,, ..	Rasheed & McDermott	,, ,,
4	Kelvin	4	,, ..	D. McKinnon ..	Beazley's Bridge
1092	,, Grove ..	3	,, ..	C. Baldry ..	Cosgrove
964	Kemp Daly ..	A	Light ..	G. H. Mimus ..	Melton
1007	Kerston	5	Draught ..	N. Ramsey ..	Prospect Farm, Newbridge
228	Khamasin ..	A	Light ..	S. Winter-Cooke	Hamilton
852	Khartoum ..	3	Draught ..	D. Munro ..	Casterton
390	Kilbourne ..	A	,, ..	A. E. Whitfield ..	E. Shelbourne
704	Killawney ..	5	.. ..	E. Neville ..	Marnoo
1162	,, Pride ..	2	,, ..	A. A. E. Albert	Willaura
253	Kilmore	A	,, ..	J. Russell, jun. ..	Orbost
158	Kilty	6	Light ..	H. J. Emonson ..	Suttons
728	King Albert ..	A	Draught ..	T. McKay ..	Malmsbury
138	,, ,, ..	A	,, ..	G. Francis ..	Lower Norton
422	,, Almont ..	A	Pony ..	J. Clarke ..	Mortlake
480	,, Ballance ..	A	Draught ..	J. H. Kennett ..	Kaniva
729	,, Bally ..	A	Pony ..	H. Lee ..	Smeaton-road, Clunes
339	,, Bee	A	,, ..	W. T. McAlpine..	Hopetoun
85	,, Duncan ..	A	Draught ..	P. Leydon ..	Cooma P.O.
549	,, Jack ..	3	,, ..	A. A. Zanker ..	Box 73, Jeparit
303	,, Jimmy ..	A	,, ..	J. Henderson ..	Leongatha
712	,, ,, ..	3	Pony ..	J. Woodfine ..	Ararat
730	,, ,, II. ..	A	,, ..	R. H. Larcombe	Mt. Moriac
590	,, John ..	5	Draught ..	A. Cail ..	Kamarooka
1172	Mauritius ..	3	Light ..	W. Cattlin ..	Elmore
731	,, of Clubs ..	A	Draught ..	J. Beard ..	Terang
2	,, of the Kings ..	A	,, ..	C. H. Hokin ..	Phoenix-street, Maldon
275	,, of the Roses II.	A	,, ..	M. McGillivray ..	Bald Rock
338	,, of the Shepherds	A	,, ..	E. R. Campbell	Nypo
985	,, of the Valley ..	A	,, ..	J. Murdock ..	Lake Bolac
1232	,, Osterley ..	A	Light ..	J. M. Fahey ..	Cameron Springs, Gnotuk
1040	,, ,, A. ..	A	,, ..	G. Anderson ..	Aberdeen-street, Newtown, Geelong
575	,, Silver ..	3	Pony ..	P. Burton ..	Charlton
1077	,, Victor ..	5	Draught ..	W. Clarke ..	Tongala
1073	,, Wilks ..	A	Light ..	J. Bright ..	Greasy Spur, Stony Creek
446	King's First ..	3	Draught ..	C. A. Jolly ..	Woomelang P.O.
891	,, Own ..	5	.. ..	A. H. Symes ..	Hopetoun
204	,, ,, ..	A	,, ..	J. Denham ..	Leongatha
55	,, Pride ..	A	,, ..	C. Nelson ..	Benalla

Stallion Register, 1924–25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
853	King's Prize ..	3	Draught ..	Mitchell & O'Brien	c/o Campbell & Sons, Bourke-st., Melbourne
70	,, Stanley ..	A	Light ..	G. Ritchie ..	Mansfield
1083	Kingling	A	Thoroughbred	M. Widdicombe ..	Gymbowen
732	Kingstanley ..	A	Draught ..	E. Land ..	Oxley
428	Kinlock	A	,, ..	W. Hicks ..	Miram
1034	Kitchener's Pride ..	5	,, ..	H. C. Younger ..	Wattle Hill, Greta
1247	Lackamore ..	5	Thoroughbred	T. D. Ryan ..	Tatura
403	Laird Again ..	A	Draught ..	P. Davey ..	Miner's Rest
66	,, O'Gowrie ..	A	,, ..	A. Wall ..	Rushworth
445	Lancashire Chief ..	4	,, ..	R. Bunworth ..	Box 6, Woomelang
167	,, Lad ..	A	,, ..	W. Robinson ..	Armstrong
458	Langdale	5	Draught ..	M. Donnellan ..	Jeffcott North
288	Larrakin	6	Light ..	F. A. Rigby ..	Box 7, Walpeup
67	Latest Style ..	A	,, ..	C. Stray ..	Kilmore
337	Le Rosier	A	,, ..	Emily Parish ..	Horsham
1215	Lee Creek Favourite	A	Draught ..	Ewart Bros. ..	Dargalong
10	,, ,, Squire	A	,, ..	T. McConachey ..	Winchelsea
699	Lennox	5	,, ..	H. L. Yard ..	Murrayville
430	Leo	A	Pony ..	J. Stewart ..	Cora Lynn
367	Leo's Pride ..	A	,, ..	Miss Small ..	Nyora-rd., Glen Iris
405	Leroy II	A	,, ..	M. O'Leary ..	Penshurst
588	Lewis Dillon ..	3	Light ..	S. J. Lewis ..	Baringhup
574	Light O'Frisco ..	A	,, ..	F. C. Radcliffe ..	Kyabram
407	Linkwood ..	A	Draught ..	W. J. Jenkin ..	Willaura
33	Lion	A	,, ..	J. F. Harley ..	Bobinawarrah
989	Little Argyle ..	A	Pony ..	W. H. Lyon ..	The Grange, Sale
279	,, Bill ..	A	Light ..	A. T. Corner ..	Fosterville P.O.
429	,, Billy ..	A	Pony ..	A. J. Glen ..	Birchip
663	,, Black Pony ..	A	,, ..	Jessie M. Armstrong	c/o A. Armstrong, Sleat Bank, Hamilton
1185	,, Comet ..	A	,, ..	T. McNally ..	Mt. Pleasant, Seymour
86	,, Eumarrah ..	A	,, ..	R. Painter ..	Leaghur
822	,, Jack Horner	A	,, ..	J. Mathews ..	Upper Delegate River
733	,, Jim ..	A	,, ..	R. McKnight ..	Maldon
1249	,, Jimmy ..	2	,, ..	S. Adkins ..	Warragul
1256	,, Mac ..	5	,, ..	W. B. Cumming	Mt. Fyans, Camperdown
495	,, Milton ..	A	Draught ..	J. Hives ..	Tempy P.O.
336	Loch Albyn ..	A	,, ..	M. O'Keefe ..	Pine Lodge Railway Stn.
481	Lord Aldie ..	A	,, ..	S. E. Mackieson	Buchan
460	,, Allan ..	4	,, ..	T. W. Barnes ..	Berriwillock
986	,, Antony ..	A	Thoroughbred	D. McMillan ..	Rainbow
687	,, Armadale ..	A	Draught ..	H. Thomson ..	Newlyn
823	,, Bindi ..	A	,, ..	R. T. E. Yapp ..	Tambo Upper
1018	,, Bingen ..	A	Light ..	W. E. H. Janetzki	Jeparit
1220	,, Cedric ..	4	Draught ..	F. A. Lehmann ..	Lismore

STALLION REGISTER, 1924–25—*continued.*

Cert No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
1239	Lord Dale ..	2	Draught ..	H. K. Thomson	Newlyn
696	,, Dalmuir ..	A	,, ..	E. W. Harders ..	Dimboola
1130	,, Derby ..	3	,, ..	A. E. Rathjen ..	Colbinabbin
677	,, Dillon ..	5	Light ..	S. J. Lewis ..	Baringhup
979	,, Dundee ..	A	Draught ..	T. Hayes ..	Hardies Hill
205	,, Everest ..	A	,, ..	G. R. Ladson ..	Mincha West
431	,, Glengyle ..	A	,, ..	W. Linehan ..	Wunghnu
482	,, Jellicoe ..	A	,, ..	McMahon Bros. ..	Galah
748	,, Lyndem ..	A	,, ..	J. Vickers ..	Colbinabbin
432	,, Northcote ..	A	,, ..	W. Hicks ..	Miram
276	,, Panic ..	A	Light ..	D. J. Hamer ..	Croydon
1231	,, Percival ..	A	Draught ..	J. M. Fahey ..	Gnotuk
917	,, Pilatus ..	A	Thoroughbred	F. G. Thornton ..	Edenhope
514	,, Plunton ..	A	Draught ..	M. J. & J. J. Runceman	Swan Hill
436	,, Ronald ..	A	Draught ..	W. Sharrock ..	Vite Vite
537	,, Threve ..	A	,, ..	W. J. Schmidt ..	Jeparit
698	,, Trentham ..	A	,, ..	C. Maher ..	Tatura
149	,, Wallace ..	A	,, ..	C. E. Cartledge ..	Kilmany
368	,, Welkin ..	A	Thoroughbred	W. & H. Carmichael	Swan Hill
794	Lorryman ..	A	Draught ..	E. Baldry ..	Cosgrove
749	Lost Time ..	A	Thoroughbred	A. Martin ..	Maffra
136	Lothian Again ..	3	Draught ..	Aust. Estates & Mortgage Co. Ltd.	114 William-st., City
536	Loudoun Squire ..	A	Light ..	S. E. Dunlop ..	Hesse-st., Colac
925	Loucen	A	,, ..	W. G. Anderson	Craigieburn
21	Loyalist	A	Draught ..	O. Gray ..	Wedderburn
478	Lucky Boy ..	3	,, ..	Graham Bros. ..	Bacchus Marsh
948	,, Charm ..	A	,, ..	D. Williamson ..	Wendouree P.O.
434	,, Jim ..	A	,, ..	J. Morris ..	Woolsthorpe
750	Lue Ribbons ..	A	Light ..	Mr. Williams ..	c/o L. Williams, Ross Creek
751	Lu Lu's Dandy ..	A	Pony ..	Sir Rupert T. H. Clarke	Lancefield Junction
898	Lymm Forest Boy ..	A	Draught .	D. A. McMillan ..	Rainbow
1005	,, Loden ..	4	,, ..	A. F. Emery ..	Tarnook P.O.
119	,, Truffle 2nd	A	,, ..	J. C. Wallis ..	Miram
811	Lymn Champion II.	A	,, ..	E. Wilson ..	Leongatha
32	Lyndale	A	,, ..	H. Conn ..	Barrakee
510	Lyndhurst ..	A	,, ..	D. Jones ..	Beulah P.O.
752	Lyntourie ..	A	Thoroughbred	L. R. Clarke ..	Newstead
522	Lysanias	4	,,	Mrs. G. A. Widdis	Langi Stud, Echuca
232	McAgain	6	Draught ..	H. E. Pilgrim ..	Kinimakatka
128	McLeish	A	,, ..	P. O'Callaghan ..	Jack River
48	Macedon Hero ..	5	,, ..	B. Evans ..	Woodfield
601	Mac's Fancy II. ..	5	,, ..	A. C. Jorgensen	Katyil
181	Magician	A	,, ..	T. Adkins ..	Korumburra
587	Magic Railway ..	5	Pony ..	Jessie Wilkin ..	278 Toorak-rd., Sth Yarra
1107	Magician J. of Shetland Heights	3	,, ..	Mrs. J. Maclellan	241 Dandenong-rd., Windsor
1032	Mahomet	A	,, ..	A. Brown ..	Rupanyup
991	Main Stanley ..	3	Draught ..	T. Harty ..	Corack East
777	Mainstitch ..	A	Thoroughbred	F. C. Mackay ..	Violet Town

STALLION REGISTER, 1924–25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
254	Major Again ..	A	Draught ..	R. Bywaters ..	Rupanyup
335	,, Dale ..	A	,, ..	J. Forster ..	Boort East
568	,, Douglas ..	4	,, ..	V. Dahlenberg ..	Winnia East
795	,, Jock ..	A	,, ..	F. C. Glanville ..	Echuca North
182	,, Lawrence ..	A	,, ..	J. Stephens ..	Gisborne
1189	,, Lee ..	2	,, ..	E. V. Menzel ..	Armytage
1154	,, Ribbonwood..	A	Light ..	F. W. Grabsch ..	Horsham
1103	,, Style ..	5	Draught ..	P. Daldy ..	Arcadia Nth
391	,, Thornley ..	A	,, ..	P. C. Payne ..	P.B., Hopetoun
604	,, Willie ..	3	,, ..	A. S. Alexander..	Diapur
206	Malacca	A	Light ..	W. P. Beattie ..	Dookie
26	Malt Lawn ..	3	Thoroughbred	J. J. Sherry ..	Portman-street, Oakleigh
435	Malstead	A	Light ..	E. J. Wright ..	Flynn's Creek
392	Maori Chief ..	A	Light ..	J. Cladow ..	Winchelsea
753	,, Jack ..	A	Draught ..	A. Potter ..	Naroghid
1199	Marcellus II. ..	4	,, ..	Forrest Bros. ..	Orford, Port Fairy
688	March Along ..	4	,, ..	H. Carr ..	Manangatang
833	Marcus	6	Pony ..	N. S. Lett ..	Box 11, Sale
74	,, ...	A	Light ..	W. E. J. Craig ..	822 Elizabeth-st., Melbourne
185	,, Junior ..	5	,, ..	Blair Bros. ..	Lara
255	Maringa	A	,, ..	E. Collins ..	Dunkeld
778	Markhope ..	A	Thoroughbred	Trustees late Rupert J. Clarke	Lancefield Junction
1142	Marquis Bold ..	4	Draught ..	W. Turnbull ..	Wedderburn
365	,, Derby ..	A	Light ..	E. Barrett ..	c/o J. Campbell, Box 21, P.O. Echuca
703	,, of Lorne ..	2	Draught ..	Dyke Bros. ..	Gre Gre Village
834	Marshall Clyde ..	A	,, ..	R. T. Fraser ..	Birchip
294	Master Brigham ..	A	Pony ..	S. Waters ..	Carboor Upper
1169	,, Dix ..	A	Thoroughbred	P. T. Larsen ..	Eskdale
535	,, Valve ..	A	Pony ..	A. Lang ..	Winter's Flat, Castlemaine
104	,, Wattee ..	A	Draught ..	Brock Bros. ..	Moe
579	,, Willie ..	3	,, ..	D. G. Gordon ..	Broughton
796	Mauritius	A	Light ..	J. B. Zander ..	King-st., Melbourne
962	Medbourne Prince ..	A	Draught ..	E. McNaughton	Narraport
1020	Melrose Bounty ..	A	Light ..	C. T. Lucas ..	Chelsea, Pomborneit
8	Menin	A	Thoroughbred	J. Dunne ..	Euroa
635	Merriment ..	3	,,	T. H. Eichler ..	Murrayville
616	Merrimic	A	Light ..	G. M. Vallence ..	Cohuna
717	Merry Chimes ..	4	,, ..	G. Gadsden ..	Chillingollah
139	,, King ..	A	Pony ..	W. F. Maroney ..	Wangaratta
890	,, Lad ..	5	Draught ..	F. C. Gertz ..	Murtoa
380	,, Oliver ..	A	Thoroughbred	E. R. De Little ..	Sth Caramut
700	Message	A	Light ..	A. J. Tack ..	Korumburra
886	Metal Bells ..	6	,, ..	H. Colvin ..	Nathalia
331	Michael	A	Pony ..	Mrs. Bell ..	Flynn
133	Mick	A	,, ..	H. Foster ..	Red Cap, via Casterton
1071	Mickey	5	, ..	H. Sanderson ..	W. Warburton
1023	,, ...	A	,, ..	R Booley ..	St. Arnaud
1145	Mid-day	4	,, ..	J. Bannam ..	Wallacedale

Stallion Register, 1924-25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
734	Middlemarch ..	A	Draught ..	M. J. Egan ..	Charlton
889	Middlerigg Referee	5	,, ..	C. Lindner ..	Murtoa
735	,, What's Wanted	A	,, ..	E. McKoy ..	Wodonga
1121	Mikado	3	Thoroughbred	A. G. Turnbull ..	Winnieburn Nth
256	Miniature 3rd ..	A	Pony ..	T. Robertson ..	Moyne Falls
736	Minstrel	A	..	R. J. Hills ..	Elliminyt P.O
695	Miranton	5	Thoroughbred	F. Foulsham ..	Glenhuntly
457	Model Voyage ..	2	Light ..	M. O'Callaghan .	Charlton
957	Model's Fancy ..	A	Draught ..	W. D. Hopper ..	Terrick South
1213	,, Herod ..	6	,, ..	M. Hutcheson ..	Pine Grove, via Mitiamo
810	Moeser	A	,, ..	J. Tallent ..	Craigieburn
129	Moira Lad ..	A	,, ..	C. R. Cunnington	Bamawm Extn.
854	Momona Ronald ..	3	Draught ..	Tubbo Estate Co.	Darlington Pt., N.S.W.
1099	Monach	4	Thoroughbred	J. Bell ..	Mudgegonga
333	Monk	A	Pony ..	R. Angus ..	Springvale
208	Montrae Bold ..	A	Draught ..	E. Don ..	Newham
455	Montrose	3	,, ..	Small Bros. ..	P.B., Birchip
609	Monty	A	Pony ..	W. S. Malseed ..	Hawkesdale
332	Moolap	A	Light ..	T. Mitchell ..	Durham Lead
531	Moorang	A	Thoroughbred	A. E. Batson ..	Somerset Stud Farm, Buckley
938	Moredun Baron ..	4	Draught ..	J. R. Mitchell ..	Moredun Hill, Sandford
939	,, Ranger ..	4	,, ..	,, ,, ..	Moredun Hill, Sandford
1210	More Huon ..	A	Light ..	H. E. Fisk ..	Leongatha
569	Morocco Chief ..	3	Draught ..	A. Arnold ..	Werrigar East, Warracknabeal
331	,, Lad ..	A	,, ..	Mrs. E. Parish ..	Green Park, Horsham
372	Mountain Twig ..	3	Pony ..	J. H. Medlyn ..	St. Arnaud
554	Moving On ..	5	Light ..	Hy. Fisher ..	Yaapeet
171	Moving Picture ..	A	Thoroughbred	Exors. of T. Maidment	Barton Estate, Moyston
708	My Chimes ..	4	Light ..	J. M. Cromie ..	Swan Hill
356	,, Fancy ..	A	Draught ..	R. Hetherington	c/o Young Bros, Horsham
1180	Mystery	A	Light ..	C. Mayne ..	Darebin-street, Northcote
524	Napoleon ..	A	Draught ..	S. J. Lewis ..	Parker's Plains Baringhup
1149	Narahquong ..	A	Thoroughbred	H. Garner ..	Alma Bank, Yan Yean
101	Newfields Baron ..	A	Draught ..	Coe Bros. ..	Coleraine
605	Newton Again ..	4	,, ..	H. Hodgson ..	Lillimur
296	,, Lad ..	A	,, ..	T. L. Skinner ..	Bordertown, S.A.
286	,, Stewart ..	A	,, ..	A. H. Borgelt ..	Tarraginnie Rly Station
330	,, Style ..	A	,, ..	Currell Bros. ..	Cowley's Creek
209	Newton's Best ..	A	,, ..	C. A. Graham ..	Rupanyup
78	,, Pride ..	6	,, ..	H. E. Cuttle ..	Ultima
47	,, Sensation	A	,, ..	R. Bonko ..	Koyuga
515	Ngapar	A	Light ..	E. Land ..	Oxley

STALLION REGISTER, 1924–25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
227	Nigger Minstrel ..	A	Thoroughbred	D. W. Hegney ..	Benalla
46	Nimrod	A	Pony ..	G. Small, jun. ..	P.B., Birchip
1139	Noble Glen ..	4	Draught ..	W. Nagorcka ..	Tarrington
328	Non Pariel ..	6	,, ..	W. Geddes ..	Boomahnoo-moonah
476	Norman's Pride ..	4	Pony ..	D. Shelley ..	Bungaree P.O.
1066	Novel Print ..	5	Light ..	P. Maher ..	Tatura
1168	Nutshell	6	Pony ..	A. M. Greenfield	Market Square, Ballarat
327	Nyallo Prince ..	A	Light	W. T. McAlpine	Hopetoun
326	Oakland's Pride ..	A	Draught ..	C. F. Dolan ..	Box 27, Ouyen
1045	Oakwood	6	,, ..	J. T. Dornan ..	Howlong, N.S.W.
824	Oakwood Direct ..	A	Light ..	A. McCracken	Bullarto South
393	October	A	Thoroughbred	H. F. & F. Hoysted	Wangaratta
809	Onward O. ..	A	Draught ..	E. Coward ..	Congupna Rd. Rly. Station
394	Operation ..	A	Light ..	T. Lay, jun. ..	Tallangatta
926	Orewar	A	Thoroughbred	T. J. Pratt ..	Vic Hotel Stable Colac
395	Orion	A	,,	W. D. Cross ..	Tangambalanga
534	Ormond Dale ..	A	Draught ..	W. Dixon ..	Donald
304	Osiris	A	Light ..	H. Scarse ..	Melton
529	Osprey Junior ..	A	,, ..	A. V. Franklin ..	33 Royal Pde., Parkville
257	Our Guide ..	A	,, ..	Geary Bros. ..	Tungamah
996	Owyhee Chief ..	A	,, ..	J. Shanahan ..	4 Corsair-street, Richmond
825	Patchwork ..	A	,, ..	H. Milte ..	Lascelles
207	Patrician	A	Draught ..	W. Gibbins ..	Galah
602	Patrician's Ace ..	3	,, ..	A. McLennan ..	Dimboola
423	,, Pride ..	A	,, ..	P. Egan ..	Bealiba
737	Patrick's Pride ..	A	,, ..	E. L. Edwards ..	Bacchus Marsh
140	Patriot	A	,, ..	A. G. Mibus ..	Croxton East
1193	,, II ..	3	,, ..	F. J. Salzke ..	Penshurst
201	Patriotic	A	,, ..	H. L. Ferry ..	Buangor
90	Pearlyn	A	Light ..	F. W. Bowden ..	Won Wron
31	Periscope	A	,, ..	J. M. Ervin ..	Pyramid
839	Peter	A	,, ..	J. Carroll ..	Mudgegonga
91	Peterhof	A	Thoroughbred	W. T. Rowe ..	Wallenduc
662	Pettadale	A	Draught ..	N. Ramsay ..	Newbridge
1201	Picaninny ..	3	Pony ..	G. Fitzgerald ..	Woolsthorpe
410	Pilot	4	Draught ..	F. Buckland ..	Genoa
200	Piper	A	Pony ..	J. Ford ..	Wickliffe,
779	Pirateer	A	Light ..	D. McArthur ..	Victoria Valley
170	Ploughboy ..	A	Draught	P. Donovan ..	Learmonth
378	Pluto of Shetland Heights	2	Pony ..	Mrs. MacLellan ..	241 Dandenong-road, Windsor
980	Pompy	A	,, ..	Miss Haines ..	Hallam Hotel, Hallam
141	Poilu	A	,, ..	Cross Bros. ..	Goroke
902	Preble	A	,, ..	A. F. McKenzie	Hexham
379	Predominate ..	A	Light ..	E. R. de Little ..	Sth Caramut
1014	Premier Dale ..	2	Draught ..	Penno Bros. ..	P.B., Boort
298	,, Jack ..	A	,, ..	V. Vaughan ..	Condah
1208	,, Lauder ..	A	,, ..	G. S. Wall ..	Earlston
862	,, Mark ..	3	,, ..	L. J. Weatherley	Woolongoon, Mortlake

Stallion Register, 1924–25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
424	Premier Montgomery of Willow Bank	A	Draught ..	E. Doherty ..	Congupna
559	,, Success ..	4	,, ..	P. H. Müller ..	Dimboola
949	,, Ward ..	A	,, ..	E. C. Humphrey	Meatian
826	Preston	A	Pony ..	E. McEvoy ..	Colbinabbin
551	Pride	3	Draught ..	J. W. King ..	Lillimur
978	,, ...	A	Pony ..	F. Mitchell ..	Walwa
92	,, of Clutha ..	A	Draught ..	J. H. Cornfoot ..	Whittlesea
738	,, of Lochiel ..	A	,, ..	J. T. Ovens ..	Cooma
739	,, the Ponds ..	A	,, ..	E. Drayton ..	Waurn Ponds
87	,, of the South ..	A	,, ..	H. G. Hill ..	Nurrabiel
1086	Prince Abbott ..	3	,, ..	A. McDonald ..	P.B. Rochester
689	,, Alexander ..	A	,, ..	J. Craig ..	Winchelsea
1200	,, Almont ..	3	Pony ..	J. Clarke ..	Mortlake
110	,, Bellinda ..	A	Light ..	O. Lock ..	Thorpdale
396	,, Bells ..	A	Light ..	R. Youren ..	Natte Yallock
513	,, Benmore ..	A	Draught ..	W. D. Starbuck..	Rupanyup
872	,, Buchlyvie ..	3	,, ..	G. W. Pennel ..	Braybrook
676	,, Coupar ..	A	,, ..	A. Cheesley ..	Barnawartha
1245	,, Denver ..	A	Light ..	Whykes & Donovan	Woodside
533	,, Douglas ..	A	,, ..	P. Martin ..	Molesworth
1207	,, Ecuador ..	A	Thoroughbred	M. J. Rovane ..	Wattletree-road Malvern
1025	,, Edward ..	A	Draught ..	D. King& Sons ..	Rutherglen
527	,, Ethrick ..	A	,, ..	A. R. Paynter ..	Violet Town
1153	,, Harold ..	A	Pony ..	H. Robertson ..	Wallacedale
682	,, ,, ..	A	Light ..	C. E. Darley ..	Hopetoun
306	,, Henry ..	A	Draught ..	P. Stratton ..	Turriff East
808	,, Lyall ..	A	Pony ..	G. L. Buchanan	Horsham
542	,, Maurice ..	A	Light ..	O. V. Morrissey	MolesworthP.O.
397	,, of Nullan ..	A	Draught ..	R. V. Quick ..	Box 37, Brim
583	,, of Roses ..	6	Light ..	T. M. Brett ..	Box 68, Ouyen
740	,, Que ..	A	Pony ..	A. E. Callow ..	520 Mair-street, Ballarat
873	,, Wigton ..	4	Draught ..	K. McKenzie ..	Wattle Park, Werribee
520	,, William ..	A	,, ..	N. J. Simmonds	Peechelba P.O.
528	Principal	A	Light ..	H. R. Emerson ..	Clear Lake
741	Quality	A	Pony ..	A. E. Callow ..	520 Mair-street, Ballarat
541	Quamby ..	A	,, ..	P. McEntee ..	Cudgee
540	Quatta's Baron Belmontian	A	Draught ..	R. F. Carmody ..	Everton
807	Quatta's Belmont ..	A	,, ..	M. Lindsay ..	Baranduda
272	Queen's First ..	A	,, ..	J. H. Hard ..	Woomelang
18	Radium	A	Light ..	Manifold & Co. ..	Purrumbete, Weerite
953	Real Scotch ..	A	Draught ..	J. Rumbold ..	Laaencoorie
1255	Reality II. ..	4	Pony ..	W. Horswood ..	Emerald
324	Red Cap	A	,, ..	D. C. MacDonald	Little Plain
36	,, King	A	Light ..	Jarvis Bros. ..	Benambra
357	,, Lion	A	Pony ..	G. H. Whitehead	Minhamite
443	,, Star	3	Draught ..	W. H. Gibbins ..	Galah
742	,, Wilkes ..	A	Light ..	E. Rash ..	5 Eyre-street, Ballarat
855	Reef Knot ..	3	Draught ..	N. Armytage ..	Queensland
806	Referee	A	,, ..	E. Allan ..	Ondit

STALLION REGISTER, 1924-25—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs			
135	Regis	A	Draught ..	E. Manifold ..	Wiridgil, Camperdown
539	Relight	A	Light ..	D. Cameron ..	Newham
444	Review	5	Draught ..	J. Donnan ..	Watchupga
142	Ribbon Bells ..	A	Light ..	Beattie Bros. ..	Tungamah
299	,, Wheel ..	A	,, ..	V. Vaughan ..	Condah
16	Richard Cleve ..	A	,, ..	H. H. Shandley	Bass P.O.
780	,, III. ..	A	Pony ..	A. Ruttle ..	Inverloch
660	Right Dale ..	A	Light ..	O. T. Ovens ..	Tatura P.B.
743	Rimfire	A	Pony ..	Lucas Bros. ..	Carlisle River
622	Ringmaster ..	A	Draught ..	L. Brooks ..	Hattah P.O.
987	Rising Star ..	6	,, ..	J. W. Hood ..	Polkemmet P.O.
523	Rizzio	A	Thoroughbred	H. A. Currie ..	Burrumbeet
1122	Roala	5	Pony ..	B. E. Lyon ..	Coleraine
442	Rob Roy	2	Draught ..	J. K. Shepherd ..	Ouyen
835	Robert Alto ..	A	Light ..	A. Kennedy ..	Tatura
398	Rocket	A	Pony ..	A. W. Thomson	Hamilton
1117	Roger Bold ..	4	Draught ..	H. Roche ..	Casterton
44	Ronya's Bells ..	A	Pony ..	Mr. Harper ..	Manager, Savings Bank, Bacchus Marsh
744	Roseberry ..	A	Light ..	W. Woodmason ..	Waverley-road, Oakleigh
558	Rosedale	3	Draught ..	P. H. Müller ..	Box 88, Dimboola
874	Roseneath Donald ..	3	,, ..	W. G. Wilkinson	Yarrawonga
875	,, Drayman	3	,, ..	M. Rasheed ..	Adelaide, S.A.
876	,, Escort ..	2	,, ..	G. W. Burrows ..	Scottsdale, Tas.
1002	,, Footprint	3	,, ..	H. Jamieson & Sons	Nth Burrajaa
877	,, Magnet ..	2	,, ..	G. W. Burrows ..	Scottsdale, Tas.
878	,, Prestige	4	,, ..	J. J. Vile ..	Moorwatha, N.S.W.
745	Roseworthy ..	A	Light ..	A. Clifford ..	Banyena
9031	Rothmont ..	A	,, ..	E. T. Meek ..	Streatham
1229	Rothschild Junior ..	A	,, ..	A. Lenon ..	Nanquo P.O.
1179	Royal	3	Draught ..	J. May ..	Joel Joel
441	,, Bearer ..	3	,, ..	J. M. Walton ..	St Arnaud
226	,, Belmont ..	A	,, ..	J. M. Egan ..	Woodleigh
258	,, Ben ..	A	,, ..	J. M. Hamilton ..	Inverleigh
1072	,, Bill ..	6	,, ..	W. J. Collins ..	Beulah
285	,, Bob ..	A	,, ..	W. Treweek ..	South Merbein
1196	,, Brigham ..	4	Pony ..	E. W. Hinkley & Son	Becac
259	,, Bute ..	5	Draught ..	G. Luckie ..	Springhurst
716	,, Charm ..	5	,, ..	T. N. Smith ..	Lalbert
597	,, Chief ..	5	,, ..	W. G. Burns ..	Goroke
836	,, Churchill ..	A	,, ..	A. Kennedy ..	Tatura
900	,, Comedy ..	A	Thoroughbred	A. Sutherland ..	Welshpool
840	,, Craig ..	6	Draught ..	H. Trimble ..	Pine Lodge
977	,, Dandy ..	A	Pony ..	C. Waiting ..	Cohuna
1090	,, Derby ..	6	Light ..	G. H. Eastaugh	743 Burwood-rd., Auburn
570	,, ,, ..	3	Draught ..	T. Maddern ..	Blackheath
1067	,, ,, ..	2	,, ..	L. A. Martin ..	Tatura
678	,, Douglas ..	A	,, ..	T. Thornton ..	Waaia
17	,, Duke ..	A	,, ..	C. W. Dennert ..	Hamilton

Stallion Register, 1924-25—*continued.*

Cert. No.	Name.	Age	Class.	Owner.	Address.
		Yrs.			
224	Royal Flush ..	A	Draught ..	M. Colton ..	Terang
671	,, Gartley ..	A	,, ..	C. B. Butler ..	Warracknabeal
130	,, Garvin ..	A	,, ..	G. F. Brown ..	Winchelsea
927	,, Hero ..	A	,, ..	G. Giddings ..	Sea Lake
580	,, Jock ..	3	,, ..	J. L. Judd ..	Yanac
992	,, King ..	4	,, ..	V. W. Daniell ..	Nandaly
45	,, Lad ..	A	,, ..	E. C. R. Spedding	Bealiba P.O.
620	,, Mac ..	A	Light ..	Charity Bros. ..	Serpentine
640	,, McGregor ..	6	Draught ..	Vallance Bros. ..	Nullawil
473	,, Main ..	5	,, ..	D. C. Greig ..	c/o Adamson, & Strettle, Bourke-st., Melbourne
856	,, Mark ..	3	,, ..	P. Fornby ..	Berrigan, N.S.W.
323	,, Mint ..	A	Light ..	L. A. Harper ..	Bacchus Marsh
260	,, Prince ..	A	Draught ..	G. G. Goudie ..	Ultima
58	,, Ribbon ..	A	,, ..	J. Morris ..	Piangil
150	,, Robin ..	A	,, ..	J. Boyle ..	Verdant Vale, Nth Boort
746	,, Rufus ..	A	Light ..	L. Morrison ..	Frederick-st., Yarraville
1061	,, Salute ..	6	Draught ..	A. Bright ..	Woorayl
1211	,, Saxon ..	A	,, ..	J. M. Hunter ..	35 Marine-pde., St. Kilda
1098	,, Seal ..	5	,, ..	J. Dugdale ..	Myrniong
302	,, Shepherd ..	A	,, ..	T. A. Heard ..	Noradjuha
598	,, Simon ..	4	,, ..	J. Patching ..	Gymbowen
448	,, ,, ..	4	,, ..	A. E. Cox ..	Alma
591	,, Standard ..	A	,, ..	K. Cameron ..	Warracknabeal
887	,, Style ..	A	,, ..	P. Morrissey ..	Molesworth
71	,, Success ..	A	,, ..	W. Elsom ..	Dart Dart
1198	,, Viceroy ..	3	,, ..	J. J. Gleeson ..	Southern Cross
883	,, Wigton ..	3	,, ..	A. P. Huf ..	Byrneville, via Dooen
960	,, Willie ..	A	,, ..	C. Rogers' ..	Wallup
747	Royalty	A	Pony ..	W. Coe ..	Coleraine
895	Rufus	4	Draught ..	Mrs. S. E. Kent	P.B. Sheep Hills
284	R. W. Estell ..	A	Light ..	G. Anderson ..	Trawalla P.O.

(To be continued.)

SUN-SCORCHED PIGS.

The following letter regarding the liability of white pigs to be sun-scorched, from an Egyptian correspondent, appeared in the *Agricultural Gazette and Modern Farming* (England) of the 29th August, 1924:—

I have been most interested in following the correspondence in your columns on the subject of sun-scorched pigs; and I note that in your issue of 1st August, Mr. Sanders Spencer has again attacked the theory that white pigs are more susceptible to sun-scorch than pigs of other colours.

Out here in Egypt pigs are rare, except among the Copts in Upper Egypt, where thousands are reared. These Coptic pigs are ugly-looking brutes, and appear to possess all the bad points that have ever been condemned by any breed society in England. But the fact remains that they are exceptionally hardy, and roam about in the sun at midday, when the temperature is anything up to 110° in the shade (and there is not much shade)!

All the pigs I have ever seen in Egypt have been white, and I have never heard of their being any other colour. The inference is obvious.

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

Young Trees.

Young trees of the Citrus family should now be making a good, thrifty growth. The foliage should be glossy, and its general appearance a bright green and healthy one. Occasional light waterings, as well as mulching of grass, or of well-rotted manure, will be helpful to the trees.

Young deciduous fruit trees will also benefit by having a grass or manure mulch; and, if it has not previously been attended to, unnecessary growths in the centre of the tree and on the main leaders should be removed.

Fumigation.

Evergreen trees, including those of the citrus family, that are infested with scale, should now be sprayed or fumigated to rid the trees of this pest. For spraying, a weak red oil emulsion, lime and sulphur spray, or resin wash will be found useful. The most successful

method, however, of dealing with the scale pest is by fumigation. The trees should be closely enveloped in an airtight sheet or tent, and hydrocyanic gas generated inside. The chemicals for generating the gas, as well as the fumes of the gas itself, are excessively dangerous, and great care is necessary in their manipulation. A wooden, enamel, or earthenware vessel is placed inside the tent, the vessel containing a mixture of 4 fluid ounces of sulphuric acid, and 12 fluid ounces of water, the acid being placed in the vessel first. Four ounces of cyanide of potassium is then quickly dropped into the vessel, the tent closed down at once, and the bottom of the tent all round covered with soil to prevent any of the gas escaping. The operator must take care that not the slightest portion of the fumes is breathed. Fumigation should be carried out at night-time or on a cloudy day, if the foliage of the trees be thoroughly dry.

The Vegetable Garden.

Celery crops will now be a prominent feature in the vegetable section. The seed may be sown from January to March, and succession plantings should be carried out occasionally during those months. The growth of celery should be quick; a fair supply of water and a good rich, loose soil are helpful to its growth.

Ample water will now be required in the vegetable garden. The surface should be kept well hoed, and mulchings of manure given wherever possible.

Cabbage, carrot, turnip, radish, lettuce, peas, cauliflower, &c., seeds may now all be sown, and young plants from any seed beds planted out.

The Flower Garden.

Constant watering and hoeing will now be required for successful gardening. Cannas will require manuring; the old flowering stem should be removed to make way for the new growths. Dahlias and chrysanthemums will need a great deal of attention, staking the growths as they develop, disbudding, thinning out weak shoots, and removing unnecessary growths. The dahlias should receive a good soaking of water during the hot weather, and liquid manure or quick acting fertilizers given when the flower buds are developing. When chrysanthemum buds are very small, liquid manure should be applied. Roses may now be summer pruned; all weak growths should be removed, and the strong ones shortened to a fairly good bud. The plants should then receive occasional waterings with liquid manure, and be kept well supplied with water.

All flowering trees and shrubs that have finished blooming should be pruned, the flowering growths removed, and, unless the seed is required, all seed heads cut off.

Cuttings of pelargoniums, zonale and regal, may now be planted, and delphinium spikes that have finished flowering cut down to make way for new growth, the plant being watered and manured. Seeds of perennial and hardy annual plants, especially winter-flowering sweet peas, Iceland poppies, stocks, and pansies, may now be sown, and a few bulbs for early flowering planted. The beds should be well manured and deeply worked in anticipation of planting the main crop of bulbs.

REMINDERS FOR MARCH.

LIVE STOCK.

Horses.—Feed as advised last month. Those in poor condition should be "fed up" in anticipation of winter.

Should horses not be feeding well and salivating, examine mouth for grass seeds. Horses running at grass are frequently affected by them. The seeds should be removed, and a mild mouth wash used. A very weak solution of Condy's Fluid will answer the purpose.

Grass seeds also cause blindness if not removed from the eye, and the inflammation reduced by bathing the eye with boracic solution. A teaspoonful of boracic acid to a pint of boiling water is the correct strength for the purpose. Should a scum remain over the eye inject into the eye every other day a small quantity of the following solution:—Sulphate of zinc, 4 grains; water, 1 pint.

Cattle.—Cows in milk should have plenty of succulent fodder and water easy of access. When cows in milk have to be fed on chaff it should be soaked with about half its bulk in water from 12 to 24 hours and the necessary concentrates mixed in at time of feeding. This soaking will soften the grain in the chaff, preventing its loss in the droppings, and is the nearest substitute for the succulence so necessary. Algerian oats should be sown on suitable land for grazing off in the winter. Sow a mixture of oats, rye, and tares or peas for winter fodder or to fill silos. Only exceptional cows and those required for town milk supply should be served between now and July. Within the next two or three months is the best time for cows to calve, as they will pay to feed through the winter and give the best returns for the season, and be dried off when the grass is dry and scarce. Calves should be given lucerne hay or crushed oats where grass is not available. It will pay well to feed crushed oats to good cows. Provide the following lick for cows:—20 lb. salt, 20 lb. bonemeal, 20 lb. air-slaked lime, ½ lb. sulphate of iron.

Pigs.—Sows about to farrow should be provided with short bedding in well-ventilated sties. See that the pigs have shade, and water to wallow in. Pigs should be highly profitable now. Pollard should be used for very young pigs, and bran for suckling sows, and to help to prevent constipation.

Sheep.—Towards the end of March, the earliest of the northern lambs are due (late October matings), and all ewes in the northern district should be kept strong for lambing. Crutching should be undertaken. This is particularly necessary if ewes are likely to become dirty in the autumn. Wool should be cleared from udders and well up over the tail. Young ewes of the merino or fine crosses are very apt to suffer if not crutched, and lambs may be lost in bad weather if this work is not attended to at the proper time. Clear wool from eyes also in the case of fine-wooled sheep. Handle ewes carefully when crutching if near lambing, as losses may result from rough treatment. Pure British breeds of ewes and coarse cross-breds may be still coming into season; in such cases, rams should be left mated to make sure of a good lambing.

In seasons of plenty, such as we are now experiencing, foot-rot is common. Attention should be given regularly in such cases. Pare the foot (except the extreme tip of the toe) with a sharp pair of pruning shears and strong knife, and remove the diseased parts; then paint the foot with a concentrated solution of salt and washing soda, or allow the sheep to stand in a bath of bluestone solution (say 2 inches deep) for a few minutes. All sheep should, if possible, be put on dry land after treatment, and re-treated every few days until free from the disease.

Ready attention should be given to all cases of fly, ophthalmia, grass-seed blindness, casting, pizzle trouble, &c.

It may pay to feed oats or other concentrates to breeding ewes in low condition, in preparation for lambing. Stocks of these foods should be secured while the market is favorable for their purchase.

Reserve the best paddock near the homestead for the lambing ewes, if possible. Ample supplies of good water is still a vital necessity until the weather breaks.

Good prices promise for wool, mutton, and lamb, of which there is a considerable shortage throughout the world.

Poultry.—Cull out the drones and get rid of surplus cockerels. Keep forward pullets well fed—eggs are rising in value. Repairs to houses should be done this month. Thoroughly cleanse all houses and pens. Spray ground and houses with a 5 per cent. solution of crude carbolic acid. The regular use of Epsom salts and sulphur once a week for the next three months, combined with strict cleanliness, will act as a safeguard against chicken pox; 1 oz. of salts and ½ oz. of sulphur to every twenty birds should be given in the mash—salts one day, and sulphur three days after. Burn all refuse and old feathers. Provide a liberal supply of green food. For each moulting hen, add a teapsoonful of linseed to the morning mash. Drinking water should be kept in cool shady spot.

BEE-KEEPING.

During February bees commence to arrange their stores of honey and pollen in preparation for the coming winter, and it is therefore unwise to interfere with the combs in the brood chamber, to insert empty combs between the brood, or to change the position of the combs.

Where there is a surplus of honey in the upper story, it is best not to take the whole of it in one operation, but to take half, and when the emptied combs are filling up again take what was left. At this time of year bees will work better and keep on breeding longer with a full, or partly filled, super than with empty combs above the cluster of bees.

When there is a shortage of honey in February or March, it is best to give only enough sugar syrup to carry the bees through till April, but to give whatever amount is necessary in the shortest possible time. Feeding extending over many days will stimulate brood-rearing, and a few weeks later the bees will be short of food again, compelling further feeding.

In the case of colonies below the normal strength in the number of bees, continuous light feeding will do no harm; it will, on the contrary, be beneficial, as it increases the number of young bees, but the feeding for winter stores should be deferred till the middle of April, when but little of it will be used for brood rearing.

CULTIVATION.

Farm.—Work fallow where possible for autumn sowing of cereals. Sow winter fodder crops, such as rye, barley, and vetches. Prepare land for lucerne plots for autumn seeding. Make silage of maize and other crops for winter use.

Orchard.—Prepare new land for planting; plough deeply and subsoil; leave surface rough. Plant out strawberries after first rain. Plant crops for green manure. Continue to fight the Codlin Moth.

Vegetable Garden.—Prepare ground for winter crops. Plant out seedlings in moist soil. Sow cabbage, cauliflower, lettuce, early peas, swede turnip, beet, carrot, radish, and early onions.

Flower Garden.—Cultivate and water. Feed dahlias, chrysanthemums, and roses. Plant out shrubs, trees, and all kinds of bulbs. Sow hardy annuals. Plant geranium and pelargonium cuttings. Spray for Aphis, Red Spider, and Mildew.

Vineyard.—Select scions, if not done last month. In cooler districts, where ripening is difficult, it may be assisted by removing basal leaves only, as soon as berries change colour. This is the month for drying currants, sultanas, and gordos (Lexias and Clusters). Do not pick before grapes are properly ripe. For instructions for packing grapes for export, apply to Department. Shipments should be made in March and early April.

Cellars.—Vintage month. For light dry wines, pick as soon as grapes are ripe; do not wait for over-maturity, as is so often done. Pay attention to temperature control and acidity; correct latter, if deficient, with tartaric acid or late grapes. Acidimeter supplied by Department; price 10s. 6d. Sulphiting and the use of pure yeasts are strongly recommended, as they insure production of sound wine; further information supplied on application.

GREEN FEED FOR WINTER

This is the most favorable season experienced for some years. SOW NOW! for the recent rains and warmth in the ground will give QUICK RETURNS

WINTER FODDER CROPS

Somner's Special Mixtures

No. 1—Rye, Dun Peas, Golden Tares (Vetches), Barley or White Oats, mixed quantity, sufficient for 1 acre - - - - - - - **15/6**

(Five-acre lots, **14/6** per acre).

No. 2—Oats, Cape Barley, Golden Tares, Tick or Horse Beans, Partridge, Dun, or Blue Peas, mixed quantity, sufficient for 1 acre - - **18/6**

(Five-acre lots **17/6** per acre).

Either of these mixtures, if cut or pastured in Winter and ploughed under in August, will make a good preparation for Lucerne to be sown in August or September.

The growing of Summer Fodder Crops imposes a tax on the resources of the soil, and as a restorative when ploughed in, the above mixtures are specially recommended. The crop comes away rapidly and makes steady headway during Winter, giving a good quantity of excellent fodder.

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English Grown (true) 8d. lb.; 65/4 cwt.
N.Z. Grown, 7d. lb.; 60/- cwt.
White Mustard (for sowing with rape) 1/6 lb.; 150/- cwt.

Egyptian or Berseem

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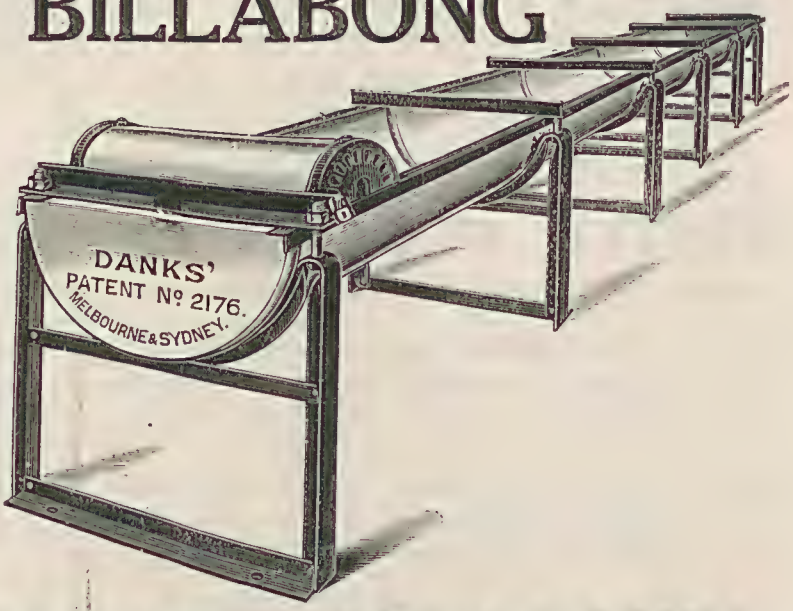

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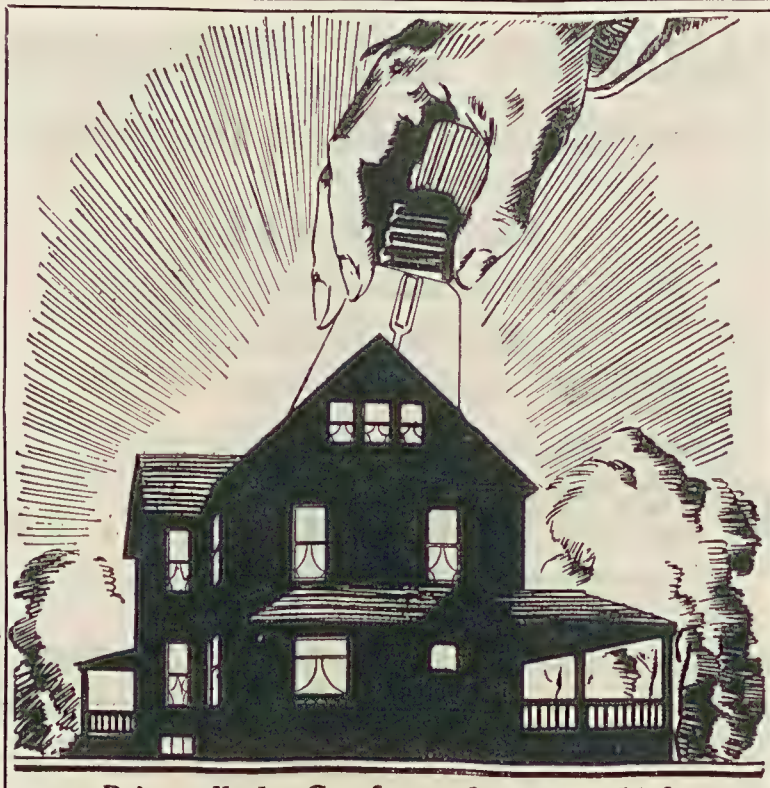

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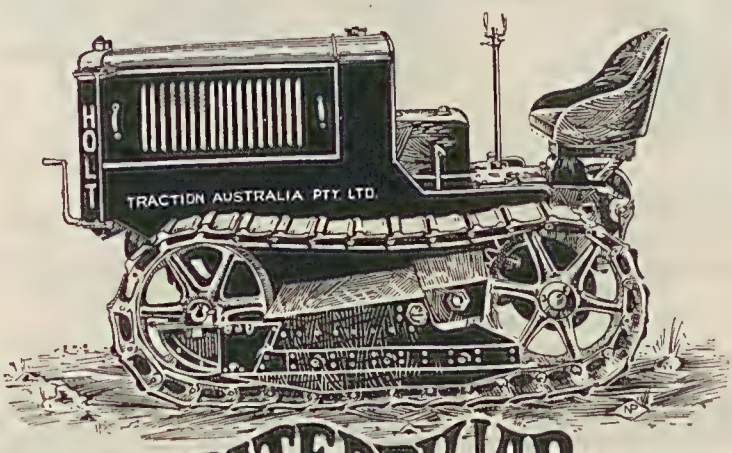

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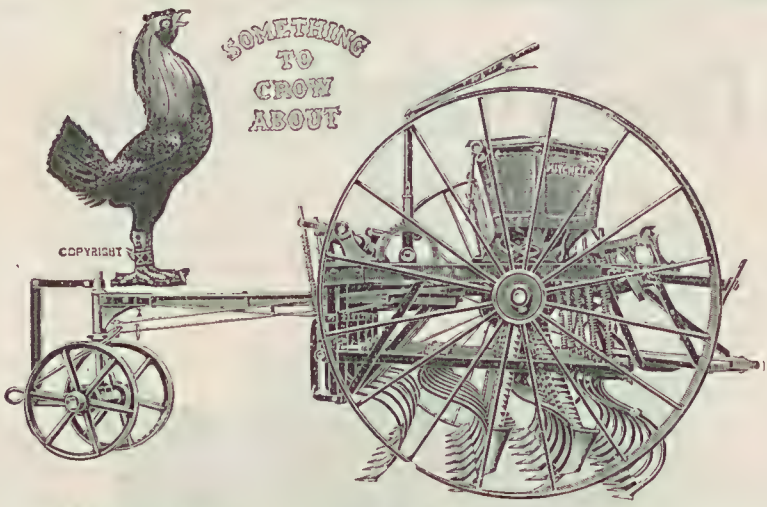

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Electric motor power totals 900 H.P.

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YATES RELIABLE SEEDS

FOR 1925

As the last month of the year slips by, the attention of every thoughtful farmer is centred on the planning of the New Year's work. Autumn is such an important time in the majority of districts, and early preparation so essential, that much of the work should now be in hand for the laying down of such lines as Pasture Grasses, Lucerne, and Clovers, and early green fodder crops like Oats and Barley. Sowing should take place during February and March.

With regard to Seed Supplies, those of our readers who have dealt with us in the past know that Yates Reliable Seeds give the cleanest, heaviest, and surest crops, they know that our Seeds give them far greater value for money than "cheap" seeds, and that the slight extra cost of Yates Recleaned and Tested Farm Seeds is more than repaid by the undoubted superiority of quality, growth, and strain. For 1925 we shall exercise the same scrupulous care in the selection, testing, and recleaning of Yates Reliable Seeds that has made them the choice of the leading agriculturists all over the Commonwealth.

We thank all our customers for their support this past season, and we wish them the Compliments of the Season and a bright and prosperous New Year 1925.

ARTHUR YATES & CO. Ltd.

Australia's Leading Seed House

SUSSEX STREET, SYDNEY, N.S.W.

Letters G.P.O. Box 2707. —— **Wires—"Seedsman, Sydney."**

By Authority: H. J. Green, Government Printer, Melbourne.

DEPARTMENT OF AGRICULTURE, VICTORIA

Red Poll Dairy Herd

The Department has now completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter *fat* yielded. Thus a calf from a cow with a 400 lbs. butter fat record is sold for 20 guineas, one from a 300 lb. butter fat cow for 15 guineas, and so on. Bull Calves *ex* heifers on their first calf are sold for a set price of 10 guineas.

(For Record of Yields of dams see Red Poll Herd Book.)

The Bulls in Use include—

VICE REGAL (95 A.A.)

Sire: Nicotine (69 A.A.). Dam: Velveteen (Imp.) 22875 (2 A.A.).

VICTORIA VOLCANO (322 A.)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).

Dam: Tonga (253 A.) by Honingham Archbishop (imp.) 9702 (48 A.A.).

Tonga's butter fat yields for 6 successive lactation periods are as follow:—1916, 341 lbs.; 1917, 398 lbs.; 1918, 419 lbs.; 1919, 479 lbs.; 1920, 428 lbs.; 1921, 562 lbs.

BELLIGERENT (Imported) 11096 (8 A.A.)

Dam's Record (1st milking) 7144 lbs. milk.

Dam's Dam's	,,	14533 lbs. milk	...	4 years	average	12871 lbs. milk.
Sire's Dam's	,,	10370	,,	...	7	,,	,,	9354 ,,
Sire's D. Dam's	,,	9510	,,	...	12	,,	,,	8033 ,,
G. Sire's D. Dam's	,,	10215	,,	...	7	,,	,,	9386 ,,
G.G. Sire's D. Dam's	,,	12565	,,	...	10	,,	,,	8853 ,,
G.G.G. Sire's D. Dam's	,,	10088	,,	...	2	,,	,,	9754 ,,

Inspection of the Herd is Invited.

Visitors will be met at the Station on notifying the Manager, State Research Farm, Werribee.

Application for purchase to

Dr. S. S. CAMERON, DIRECTOR OF AGRICULTURE, MELBOURNE.

YOU SHOULD NOT MISS

MOUNT BUFFALO

MOUNT BUFFALO is an enchanting summer resort—30 degrees cooler than the plains; soul-stirring grandeur and wild magnificence; unforgettable outlooks with sunrises and sunsets of ethereal beauty; giant rocks and crystal streams; drooping ferns and plashing waterfalls; wonderful fishing; splendid accommodation with unexcelled meals—almost everything, in fact, for the perfect holiday.

BUFFALO rises 5,645 feet above sea-level in North Eastern Victoria. It is popular at all times of the year. Its fine lake of 60 acres provides fishing, boating, and bathing in the Summer, and ice-skating in the Winter, when snow sports of all kinds are in gloriously full swing.

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QUEEN'S WALK, opposite Town Hall, MELBOURNE, for particulars.

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